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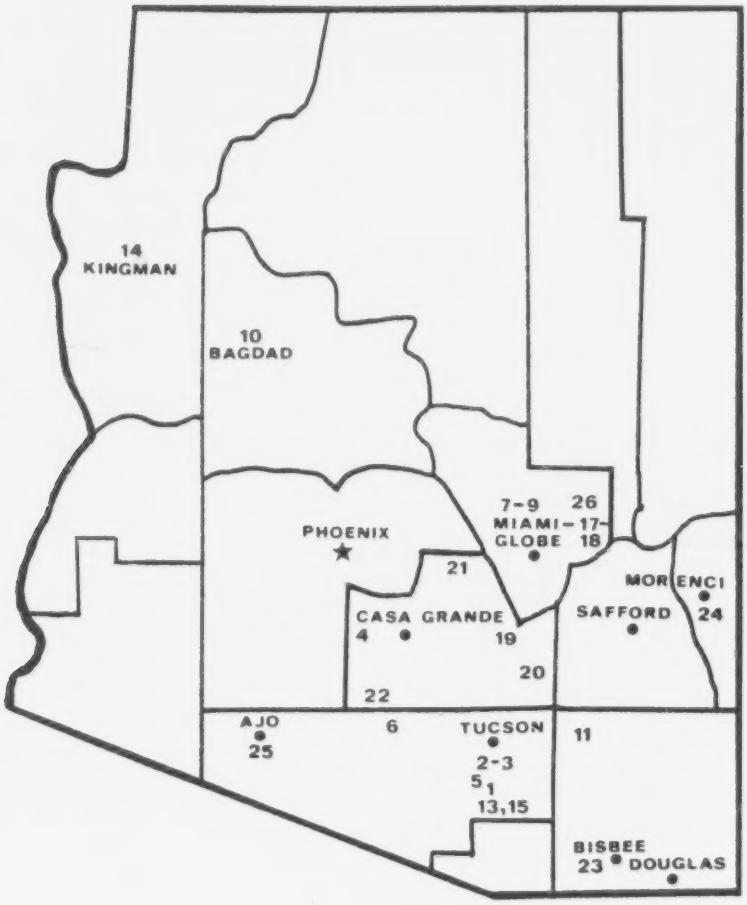
THE PRIMARY COPPER INDUSTRY OF ARIZONA IN 1984

SPECIAL REPORT NO. 9



BY

CLIFFORD J. HICKS
FIELD ENGINEER

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ABOUT THE COVER

The producing copper mines and operations listed below correspond to the location and numbers on the cover.

COMPANY
#. Mine

ANAMAX MINING COMPANY
1. Twin Buttes
2. Eisenhower

ASARCO INCORPORATED
2. Eisenhower
3. Mission
4. Sacaton
5. San Xavier
6. Silver Bell

CYPRUS MINES CORP.
10. Bagdad
11. Johnson
12. Pima

DUVAL CORP.
13. Esperanza
14. Mineral Park
15. Sierrita

INSPIRATION CONSOLIDATED COPPER CO.
16. Christmas
17. Inspiration
18. Oxhide Mine
26. Bluebird Mine

KENNECOTT CORPORATION
19. Ray

MAGMA COPPER CO.
20. San Manuel
21. Superior

NORANDA LAKESHORE MINES, INC.
22. Lakeshore

PHELPS DODGE CORP.
23. Copper Queen Branch
24. Morenci Branch
Metcalf Mine
Morenci Mine
25. New Cornelia

PINTO VALLEY COPPER CORP.
7. Copper Cities Operations
8. Miami Mine
9. Pinto Valley

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By

Clifford J. Hicks, Field Engineer

January 1986

ARIZONA DEPARTMENT OF MINES & MINERAL RESOURCES

JOHN H. JETT, DIRECTOR

PHOENIX OFFICE

MINERAL RESOURCES BUILDING
FAIRGROUNDS
PHOENIX, ARIZONA 85007
(602) 255-3791

TUCSON OFFICE

STATE OFFICE BUILDING
416 W. CONGRESS, ROOM 161
TUCSON, ARIZONA 85701
(602) 628-5399

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And, to John H. Jett, Director, ADMMR, sincere appreciation for the opportunity to compile data relating to Arizona's copper industry in 1984 and present it in a convenient form.

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1/ Throughout this report a "ton" means a short ton (2,000 pounds or 0.90718 metric ton).

Certain specific statistics may vary slightly from Table to Table. This is due to differences in their source.

INTRODUCTION

The Arizona Department of Mines and Mineral Resources presents herein a report covering activity in Arizona's copper industry in the calendar year 1984. A brief review of operational highlights reported by the major developers and producers in the State, market and price developments which affected copper production and discussions of Arizona inventory and severance taxes on metalliferous minerals are included.

The contained statistical tables include various production, employment, inventory, import/export, prices, costs and ore reserve numbers for 1984. Production of recoverable copper is given for individual mines and by company. Figures showing the importance of copper in the mining industry are furnished, as are data on the by-products of copper mining; gold, silver and molybdenum. In addition, historical compilations are included for leach copper, average grade of ore produced, percent copper recovered, open pit mine stripping ratios, and employment and earnings. Additional compilations indicating refined copper inventories in and out of the United States and average copper prices by month from 1974 through 1984 are provided. Also included are tables showing designed mine capacity and copper reserves in Arizona plus average copper cash production costs for the United States, 1981-84.

The Department maintains extensive reference libraries in its Phoenix and Tucson offices concerning the copper industry in Arizona. These repositories include information on individual mines and mining companies, United States Bureau of Mines and United States Geological Survey publications, other professional publications and periodicals and earlier editions of this report. Additionally, experienced mining engineers are available for consultation, at no charge, on matters germane to the minerals industry. Office hours are 8 a.m. to 5 p.m. on all non-holiday weekdays.

COPPER PRODUCTION IN ARIZONA---1984

Arizona, in spite of production curtailments and mine closures, continued to lead the nation in the production of copper. In 1984 the state's mines produced 824,486 tons of copper, up 10% from 1983 production and down 28% from the record 1981 production. This, however, was 68.8% of the United States' total (Table XII); up 3.3% from 1983.

In 1984, the gross value of nonfuel mineral production, i.e. excluding coal, natural gas and petroleum, in Arizona was $1,476,374,000 (preliminary); down 2.3% from 1983. Of this total, copper production contributed 74.5% (Table X). Other major contributors to the total value of mineral production is the state included molybdenum (5.3%) and gold and silver. Virtually all of the molybdenum and most gold and silver are byproducts of the treatment of copper ores. As a result, Arizona ranks fourth in the United States production of silver and fifth in the production of gold in 1984.

Copper was produced in 19 major Arizona copper mines in 1984. Molybdenum was recovered as a by-product at seven of the copper mines during the year (TableI). Ten mines produced 94.46% of Arizona's 1984 copper output and two produced almost 95% of the molybdenum. The four largest producing mines, Morenci-Metcalf, San Manuel, Ray and Sierrita, in descending order of production accounted for 65% of the total copper recovered. The Morenci-Metcalf mines of the Phelps Dodge Corporation, now statistically united, led copper production with 27.5% of the total and Duval's Sierrita mine produced 76.5% of the state's by-product molybdenum.

Copper produced by leaching methods during 1984 was slightly over 285 million pounds, about the same as 1983, and accounted for 18% of total primary production (Table II).

Out of the seven solvent extraction/electrowinning copper recovery plants in Arizona, six operated during 1984. Solvent extraction uses a liquid ion-exchange process to increase the copper concentration of the solvent solution from which the copper is then recovered by electrolytic deposition. Some of the advantages of solvent extract over the cementation process are: no air pollution is produced, there is a net reduction in energy costs and the end product is high grade cathode copper which can be marketed directly.

In 1984 there were twelve open-pit copper mines operating in the state that conducted stripping operations over their ore bodies. The stripping ratios--the amount of waste removed compared to the amount of ore mined--at these operations for the past decade are presented in Table VIII. The rebound in the weighted average stripping ratio in 1984 (1.10:1) over 1983 (0.57:1) seems to reflect a degree of producer optimism for better future market conditions.

Copper sulfide ores were the source of 80% of the Arizona copper produced in 1984. The average sulfide ore has averaged 0.605% Cu from 1974 through 1984. The 1984 weighted average sulfide grade was 0.70% Cu which is the second mineral industry recession year in which sulfide grades have risen above the decade's average (Table VI). This grade rise coupled with an increased stripping ratio infers that some of the stripping made accessible higher grade portions of individual ore bodies.

Table XII shows an estimate of the capacity to produce primary copper at each of the state's principal operations. Total estimated design capacity is 1.188 million tons annually. The Arizona mines, their concentrators and leach plant facilities operated at 66.6% of estimated capacity during 1984.

Employment in Arizona's copper industry was 12,556 persons during 1984. That was a decrease of almost 10% from the previous year and the lowest since 1959 (Table XVI). However, worker productivity (copper produced per manhour) and average hourly earnings increased (Table XIX). The aggregate man-hours worked dropped 4%. The Arizona production worker's average hourly production of ore was 8.250 tons, 0.10 ton less than in 1983, while the average hourly production of copper was 89.921 pounds, an increase of 7.155 pounds. Earnings of the production workers rose $0.13 to an average hourly rate of $13.41, an increase of 1% (Table XIX).

In addition to the waning world-wide recession, and low priced foreign competition, many factors affect the production of copper in Arizona. Most technological factors are so interwoven that to isolate one and describe its impact is extremely difficult and often misleading. An even more difficult task is to properly evaluate the rapidly enlarging scope of economic and socio-political factors that influence daily the decisions made by developers and producers of copper. Foremost in any consideration of production capacity is the availability of deposits of copper mineralization. A list of most of Arizona's rich endowment of copper reserves is given in Table XXIII.

It should be emphasized that, although the reserves listed in Table XIII totals billions of tons of ore, the number can move upward or downward drastically with market price, improved technology or changes in U.S. policy or economy. If, for example, socio-political factors such as capricious rules and regulations imposed by governments become too burdensome, many of these deposits may never be developed and some existing mines may be closed. One must never lose sight of the fact that the word "ore" is not a geological or mineralogical term but simply an expression of economic value. If rock containing a marketable commodity can be mined, processed, and transported and the commodity marketed <u>at a profit</u> then the rock is ore--if not, it is mineralized waste. This is the difference between a copper ore reserve and a copper resource. However, some copper mines have been producing and selling copper for prices under cost because it is, in some instances, more economical to maintain some production than to mothball the operations.

A BRIEF REVIEW OF THE 1984 COPPER MARKET AND A LOOK TO THE FUTURE

Copper mining has always been a cyclical industry, although the current slump due to low worldwide market prices and foreign competition, exacerbated by high real interest rates, a strong U.S. dollar and stingent pollution controls, is the worst it has faced since the great depression of the early 1930's. However, unless the light at the end of the tunnel is that of an oncoming train i.e. another world-wide recession, there would appear to exist some hope for the industry in the not too distant future.

Most comparisons regarding the copper market have been made to 1981, the industries best year, rather than to a typical year. For example, production of copper during 1984 was only 11% less than the average of the 1970's. Mining employment, however, was 41% less in 1984 than the average of the same decade indicating a marked increase in productivity.

In 1979, imported copper accounted for 10% of domestic consumption. By 1984 this figure had risen to 29% most of this coming from Chile, Zambia, Zaire, Canada, Oceania, Peru and the Phillipines. However, "stocks of copper on the commodity exchanges in London and New York have fallen dramatically since early 1984 and are now (May, 1984) close to a normal range of 200,000 to 300,000 tons. The drop has been more pronounced on the LME."

"Free World consumption of copper increased 9% in 1984 to 8.2 million tons while refined production dropped 3% to 7.8 million tons. Demand has continued to exceed supply so far in 1985 as evidenced by the continuing decline in inventories of refined copper."

"As for supply, the public sector copper producers have been operating at capacity right along and have no excess capacity to bring on stream to meet the current demand."

"Many of the closed mines in North America probably will not be able to reopen under any predictable set of economic assumptions. Indeed, announcements and rumors of new closings and curtailments rather than that of reopenings seen still to be the order of the day and the prolonged period of low copper prices has discouraged the development of major new copper mines."

"Therefore, barring a near-term economic downturn, an event that no one seems to expect, the fundamentals of supply and demand in the world copper market appear to be rapidly approaching a degree of strength sufficient to override the broad economic factors."

Source: Text in quotation marks from a speech by Richard de J. Osborne, President, ASARCO, Inc.

HIGHLIGHTS OF COMPANY OPERATIONS IN ARIZONA

ANAMAX MINING COMPANY

Anamax Mining Company is an equal partnership between Anaconda Minerals Company, a wholly owned subsidiary of the Atlantic Richfield Company and AMAX Incorporated. The company operates the Twin Buttes open-pit mine and controls the Palo Verde ore reserves under a lease from the State of Arizona. An agreement is in effect with ASARCO Incorporated for mining the Palo Verde deposit. Anamax is an equal partner with ASARCO in the Eisenhower Mining Company which mines the Palo Verde deposit. Anamax's share of Eisenhower ore is processed at the Twin Buttes mill.

"Under the terms of a consent order issued by the Federal Trade Commission on October 29, 1979, in an administrative proceeding in which it had challenged the acquisition of common stock of the Anaconda Company by Atlantic Richfield and the subsequent merger between the companies, the Company is required to divest most of its interest in Anamax by October 1984, the consent order provides for the appointment of a trustee with concurrent authority to solicit for the sale of the interest at fair value during the following three years. Anamax suspended sulfide mining at the Twin Buttes mine on January 31, 1983." 1/

The Twin Buttes mine remained closed for all of 1984. Stockpiled ore was milled and then treated by solvent extraction/electrowinning. The Eisenhower mine was worked by ASARCO alone and Anamax did not receive any of the ore.

1/ Atlantic Richfield Company Annual Report on Form 10-K, 1983, pp. 708

ASARCO INCORPORATED

ASARCO owns and operated four open-pit mines in Arizona: Mission, Sacaton, San Xavier and Silver Bell.

At Silver Bell the mine and concentrator were shut down August 15, 1984. A leaching operation at the mine continued to produce copper at about one-fourth of Silver Bell's normal rate of 21,000 tons per year.

The Sacaton mine was permanently closed March 31, 1984 due to exhaustion of ore reserves. An underground copper deposit at Sacaton was under development until September 1981. At that time work was suspended because of high costs and a weak copper market. It remained shut down through 1984 with no plans to reopen in the foreseeable future.

The above efforts to cut costs have reduced ASARCO'S Arizona copper production to 9.83% of the state's 1984 total. In 1983 the company produced 11.26%.

The Eisenhower open-pit mine is operated and partially owned by ASARCO. The company's share of Eisenhower ore is processed with ore from the San Xavier at the Mission concentrator.

Other ASARCO operations in the state include a smelter and acid plant at Hayden, Arizona. A new INCO flash furnace began operation at the smelter in early 1984.

CYPRUS MINES CORPORATION

Cyprus Mines Corporation is a wholly owned subsidiary of the Standard Oil Company of Indiana (Amoco). Cyprus' operations include the Bagdad, Johnson and Pima open-pit mines.

Cyprus Mines owns 75.01% of the Pima mine with Utah International (wholly owned by the General Electric Company) being the non-operating partner. As a result of depressed copper prices all mining and milling operations at Cyprus Pima were halted October 1, 1982 and remained closed through 1984.

The Cyprus Bagdad mine was shut down From February 12 through October 15, 1984. Copper production during this period was by SX/EW only during this period. As a result, production decreased 70% in 1984.

Cyprus Johnson mined only 52,100 tons of copper ore and no overburden during 1984. Recovery was by SX/EW only.

The Cyprus Metallurgical Processes Corporation at Sahuarita, Arizona near the Pima mine is phasing out its operations with about 20 employees at the end of 1984. Closure is scheduled for June 28, 1985.

Amoco has announced an intended spinoff of Cyprus Minerals Co. which includes most of the Amoco Corporation's coal, metal and industrial mineral assets. With the approval of their board of directors, Amoco will distribute one share of Cyprus Minerals Co. stock for each 10 shares of Amoco's stock. The spinoff takes effect July 1, 1985.

DUVAL CORPORATION

Duval is a wholly owned subsidiary of the Pennzoil Company. Duval's Arizona operation consists of the Esperanza and Mineral Park open-pit mine, concentrator and a ferro-molybdenum plant. The CLEAR (Copper Leach, Electrolysis and Regeneration) plant adjacent to Sierrita has been shut down since April 1982.

The corporation's two smallest copper/molybdenum mines (Esperanza and Mineral Park) have been closed since 1982 and produced only precipitate copper.

Sierrita has been steadily increasing production and reducing costs. It ranked fourth in 1984 copper mine output and first in molybdenum. In 1983 it ranked sixth in copper production. (see Table IV this report).

"In November 1984, Pennzoil's Board of Directors authorized a write-down of approximately $100 million ($67 million after tax) of the company's metals assets as part of a decision to withdraw from the mining of base metals and to dispose of the properties related to these activities in an orderly manner. Metals activities, on which Pennzoil lost $16.0 million, $16.3 million and $30.0 million after taxes in 1984, 1983 and 1982, respectively, have been included as discontinued operations in the accompanying financial statements." 1/

1/ Pennzoil Company, 1984 Annual Report on Form 10-K, P. 19, "Discontinued Operations."

EISENHOWER MINING COMPANY

The Anamax Mining Company and ASARCO Incorporated are equal partners in the Eisenhower Mining Company which was formed to develop the Palo Verde deposit. Mining of the deposit under the joint venture agreement is expected to reduce operating costs greatly for both companies and to lengthen the life of the Mission and San Xavier mines significantly by eliminating some pit slopes and recovering ore that would ordinarily have to be left along property lines. The agreement contains provisions governing the amount of ore each partner will receive, the timing of ore delivery and allocation of costs between the partners.

ASARCO is the mine operator and its share of the ore is processed into concentrates at the Mission mill.

INSPIRATION CONSOLIDATED COPPER COMPANY/INSPIRATION MINES INC.

As a result of a reorganization effective July 6, 1983, Inspiration Consolidated Copper Company/Inspiration Mines Inc., became a unit of a parent holding company, Inspiration Resources Corporation (formerly Plateau Holdings Inc.). Inspiration Resources Corporation now owns all of the Common Stock and 97% of the Class A Preferred Stock of Inspiration Consolidated Copper Company. The remaining 3% is held by fewer than 300 shareholders. The termination of registration of such stock with the Securities and Exchange Commission took effect on January 25, 1984. Inspiration Consolidated Copper/Inspiration Mines conducts Inspiration Resources United States' metals business,while another unit, Hudson Bay Mining and Smelting Company, Ltd. now operates their Canadian metals business.

The company's operations in the Miami, Arizona area include the Inspiration area open-pit mine (Joe Bush, Live Oak, Red Hill and Thornton); a concentrator; a ferric cure leaching solvent extraction-electrowinning plant; the Ox Hide mine's precipitation plant (shut down without production in 1983 and 1984); the Inspiration smelter and acid plant; and the Christmas underground, open pit mine and concentrator, shut down without production in 1983 and 1984.

Additionally, the Bluebird mine, formerly a Ranchers Exploration and Development Corporation property, was acquired by Inspiration from Hecla Mining Company about the time of Ranchers takeover by Hecla. The Bluebird mine suspended operation October 25, 1982 and remained inactive through the remainder of 1982 and all of 1983 and 1984.

KENNECOTT

The Kennecott is a wholly owned subsidiary of the Standard Oil Company of Ohio (Sohio). Sohio, in turn, is 53% owned by a subsidiary of the British Petroleum Company.

The Ray Mines Division (Arizona) of Kennecott includes and open-pit mine (at Ray, Arizona), a sulfide concentrator, a solvent extraction/electrowinning plant, a dump leaching and precipitation plant, a pyrometallurgical smelter (at Hayden, Arizona) and a sulfuric acid plant. The division was shut down from May 1982 until September 1983; since September 1983 the mine and the concentrator have been operating at close to full capacity, but the smelter and the electrowon cathode refinery are still closed. Mill concentrates are sold to ASARCO at its Hayden smelter.

MAGMA COPPER COMPANY

Magma, like Pinto Valley Copper Corporation, is a wholly owned subsidiary of Newmont Mining Corporation. Magma operates two underground mines, San Manuel (40 miles northeast of Tucson) and Superior (65 miles east of Phoenix) with a concentrator at each. Also located at San Manuel are a smelter, a sulphuric acid plant, an electrolytic refinery and a continuous rod casting plant. The Superior mine was shut down in August 1982 and remained on care and maintenance status in 1983 and 1984. The Kalamazoo ore body, believed to be a faulted extension of the San Manuel deposit, was under development but work has been suspended since late 1981 as a cost reduction measure. This ore body is adjacent to and deeper than San Manuel.

"Operating at 90% of capacity during the year, the San Manuel mine produced 20.3 million tons of ore averaging 0.638% sulfide copper. This compares with 18.3 million tons of 0.642% sulfide copper in 1983." 1/

"Following the reopening of Pinto Valley Copper Corporation's mine and mill in May 1984, concentrates from that mill were shipped to Magma's San Manuel Smelter beginning in June." 1/

"In late February, 1985, Magma initiated a $70 million project involving the mining and leaching of oxide ore at San Manuel. Some 56 million tons of ore are amenable to open-pit mining and leaching-solvent extraction-electrowinning processes. Estimates indicate possible production of more than 40 million pounds a year of cathode copper from this source at a low operating cost, commencing in mid-1986. Test work also is continuing on in-situ leaching of the more extensive deeper portions of the oxide orebody, which has caved because of mining of the underlying sulfide ore." 1/

Magma's parent company, Newmont Mining Corporation, realized a 1984 $4.5 million pretax write-off of their capitalized costs in connection with the cancellation of a copper property lease (Vekol Hills, Pinal County) on the Papago Indian reservation in Arizona.

1/ Newmont Mining Corporation Annual Report, 1984, p.13.

NORANDA LAKESHORE MINES, INC.

Noranda Lakeshore Mines, Inc. is a wholly owned subsidiary of Noranda Mines Ltd. of Canada. The mine is located 28 miles southwest of Casa Grande, Pinal County, Arizona, on the Papago Indian Reservation.

All underground development was suspended in April 1982, but a successful test program resulted in the development and construction of a full-scale in situ leach facility designed to extract copper from the broken low grade oxide ore remaining from the mined out block cave operation.

Underground mining and vat leaching at Lakeshore was terminated in late 1983 and replaced by in situ leaching. Pregnant solutions are pumped from collection sumps and dams to the surface for distribution to the solvent extraction/electrowinning plant.

Noranda Lakeshore's 1984 copper production was about 1% of Arizona's total.

PHELPS DODGE CORPORATION

Phelps Dodge has five copper units in Arizona: 1. The Morenci Branch is comprised of the Morenci open-pit mine which now includes the Metcalf open-pit mine, two concentrators, a dump leaching and precipitation plant, the Morenci smelter and acid plant. 2. The New Cornelia Branch of Ajo includes an open-pit mine, a concentrator, a smelter and acid plant. 3. The Copper Queen Branch at Bisbee activities include leaching at the Lavender Pit and dumps; a precipitation plant; and underground exploration and mining for precious metal bearing flux. 4. The Douglas Reduction Works (Douglas, Arizona) operates a smelter with a rated capacity of 700,000 tons per year of input material. 5. The Safford Branch is a low-grade sulfide copper deposit near Safford, Arizona. Active underground development work was suspended in April 1982 and has, since been maintained in standby condition.

In August 1984 the mine at Ajo shut down for an indefinite period. It is Phelps Dodge's highest cost operation and capable of producing 40,000 tons of copper annually. Plans are to defer reopening it until copper prices are well and firmly above 80 cents per pound. The new solvent extraction/electrowinning plant at Tyrone, New Mexico began production in April 1984 and has partly offset the loss of Ajo's production.

Operations at the Morenci smelter were suspended at year-end 1984. "With the shut down of the Ajo mine and the termination of a toll smelting contract with AMOCO Minerals company, smelting requirements no longer necessitated immediate completion of the capital-intensive program to bring the Morenci smelter into full compliance with applicable air quality regulations." 1/

Morenci has been Phelps Dodge's principal copper producer. In 1984 "nearly 217,000 tons of copper were produced, compared with 194,000 in 1981---the last previous year of normal operations---with a work force that averaged 2,040 employees, compared with 3,230, in 1981." 1/

"In labor, decertification elections were held in the fall of 1984 at our Arizona locations and El Paso refinery, and in all cases the employees voted overwhelmingly against union representation." 1/ "earlier this year we signed a letter of intent with Sumitomo Metal Mining Co., Ltd. and Sumitomo Corporation for the sale of a significant minority interest in our Morenci operation (not including the shut down smelter). Under the proposed joint venture, we would remain the operator of the properties. Sumitomo would own its proportionate share of concentrates and precipitates produced at Morenci and presently intends to ship them to Japan for smelting, refining and sale." 1/

As in 1983 the Phelps Dodge Corporation was the state's largest copper producer and its Morenci/Metcalf the largest producing mine. (See Tables III and IV).

1/ Phelps Dodge Corporation Annual Report, 1984, pp. 4,5.

PINTO VALLEY COPPER CORPORATION

Pinto Valley Copper, as is Magma Copper Company, is a wholly owned subsidiary of Newmont Mining Corporation. It was established in March 1983 to acquire the mines, mill and electrowinning facilities of the Miami Division of Cities Service Company. Unfavorable market conditions and low copper prices in 1983 caused Pinto Valley Copper to limit production to its low-cost leaching and solvent extraction-electrowinning operations. "Following the reopening of Pinto Valley Copper Corporation's mine and mill in May 1984, concentrates from that mill were shipped to Magma's San Manuel smelter beginning in June." 1/

1/ Newmont Mining Corporation Annual Report, 1984, p. 13.

CONTACT INFORMATION FOR MAJOR COPPER PRODUCERS
OPERATING IN ARIZONA

Anamax Mining Company

Twin Buttes Mine, Box 127, Sahuarita, AZ 85629. Phone (602) 791-2810.

ASARCO Incorporated, 180 Maiden Lane, New York, NY 10038. Phone (212) 669-1000.

Tucson Office, 1150 N. 7th Avenue, P.O. Box 5747, Tucson, AZ 85703. Phone (602) 792-3010.

Hayden Unit, P.O. Box 98, Hayden, AZ 85235. Phone (602) 356-7804.

Mission Unit, P.O. Box 111, Sahuarita, AZ 85629, West Pima Mine Road. Phone (602) 791-2920.

San Xavier Unit. Same as Mission Unit.

Sacaton Unit, P.O. Box V, Casa Grande, AZ 85222. Phone (602) 836-2171. Located 3 miles northwest of Casa Grande on Maricopa Road.

Silver Bell Unit, Silver Bell, AZ 85270. Phone (602) 622-6751.

Cyprus Mines Corporation, 7000 S. Yosemite St., Englewood, CO 80112. Phone (303) 740-5000.

Cyprus Bagdad Copper Company, P.O. Box 245, Bagdad, AZ 86321. Phone (602) 633-2241.

Cyprus Johnson Copper Company, P.O. Box 2108, Benson, AZ 85602. Phone (602) 586-2241. Located 1½ miles north of Highway I-10 via Exit 322.

Cyprus Pima Mining Company, P.O. Box 7187, Tucson, AZ 85725. Phone (602) 791-2870.

Duval Corporation, 4715 E. Fort Lowell Road, Tucson, AZ 85712. Phone (602) 323-5600.

Mineral Park Division, P.O. Box 3009, Kingman, AZ 86401. Phone (602) 565-2226. Located 7 miles north of Kingman.

Esperanza and Sierrita Properties, P.O. Box 125, Sahuarita, AZ 85629. Phone (602) 791-2950. Located 32 miles south of Tucson.

Inspiration Consolidated Copper Company/Inspiration Mine Inc.

Inspiration, P.O. Box 4444, Claypool, AZ 85532. Phone (602) 473-7000.

Kennecott, Ten Stamford Forum, Stamford, CT 06904. Phone (203) 964-3000.

Ray Mines Division, P.O. Box 9, Hayden, AZ 85235. Phone (602) 356-7811.

Ray, AZ (mine), phone (602) 363-5531.

Magma Copper Company, P.O. Box M, San Manuel, AZ 85631. Corporate Headquarters phone (602) 385-2201.

San Manuel Division (Same as corporate headquarters above).

Superior Division, P.O. Box 37, Superior, AZ 85273. Phone (602) 689-2444

Noranda Lakeshore Mines, Inc., P.O. Box C-6, Casa Grande, AZ 85222. Phone (602) 836-2141.

Phelps Dodge Corporation, 300 Park Ave., New York, NY 10022. Phone (212) 940-6400.

Western Operations Office, 2600 N. Central Avenue, Phoenix, AZ 85004-3015. Phone (602) 234-8100.

Douglas Reduction Works, P.O. Drawer E, Douglas, AZ 85607. Phone (602) 365-2441.

Copper Queen Branch, Highway 92, Bisbee, AZ 85603. Phone (602) 432-3621.

Morenci Branch, Morenci, AZ 85540. Phone (602) 865-4521.

New Cornelia Branch, Ajo, AZ 85321. Phone (602) 387-7451.

Safford Branch and Small Mines and Mine Development, Box 151, Safford, AZ 85546. Phone (602) 428-6900.

Pinto Valley Copper Corporation, Box 100, Miami, AZ 85539. Phone (602) 425-7611.

Parent Companies

ASARCO Incorporated, 180 Maiden Lane, New York, NY 10038. Phone (212) 669-1000.
(Anamax Minerals Company, 50%)

Atlantic Richfield Company, 515 South Flower St., Los Angeles, California 90071. Phone (213) 486-3511.
(Anaconda Minerals Company, 100%-Anamax Minerals Company, 50%)

Inspiration Resources Corporation, 250 Park Ave., New York, NY 10177. Phone (212) 503-3100.
(Inspiration Consolidated Copper Company/Inspiration Mines Inc., 100%)

Newmont Mining Corporation, 300 Park Ave., New York, NY 10022. Phone (212) 980-1111.
(Magma Copper Company and Pinto Valley Copper Corporation, 100%)

Noranda Mines Ltd., P.O. Box 45, Commerce Court West, Toronto M5L 1B6, Ontario, Canada. Phone (416) 867-7111.
(Noranda Lakeshore Mines, Inc., 100%)

Pennzoil Company, P.O. Box 2967, Houston, Texas 77252-2967. Phone (713) 546-4000.
(Duval Corporation, 100%)

Standard Oil Company (Indiana), 200 East Randolph Dr., Chicago, Illinois 60601. Phone (312) 856-6111.
(Cyprus Mines Corporation, 100%)

Standard Oil Company (Ohio), Midland Building, Cleveland, Ohio 44115. Phone (216) 575-4141.
(Kennecott, 100%)

SEVERANCE TAX ON METALLIFEROUS MINERALS

Background

Laws of 1982, Chapter 230 repealed the tax on sales of metalliferous minerals and enacted a severance tax in its place. Under the provisions of the severance tax, metalliferous minerals were to be taxed at the time of production, not at the time of sale. All metalliferous minerals produced after 1982 were to be taxed on the greater of the following two values:

1. The "weighted mineral value" which is essentially the cost of extracting the minerals from the earth and delivering them to the site where they will be processed, or

2. A specified percentage of the old sales tax base.

The severance tax was to be levied on metalliferous minerals at a rate of 2½ percent. Unless otherwise provided by law, the tax was to be administered in the same manner as the sales tax. As a result, severance tax payments were due on the first day of the second month following the month in which the tax accrued. From January 1, 1983 through June 30, 1983, 40 percent of the severance tax was to be distributed in the same manner as the transaction privilege tax (i.e. 25 percent to the cities, 33.6 percent to the counties and 41.4 percent to the state). In subsequent fiscal years, a progressively larger share of the severance tax was to be distributed in the same manner as the transaction privilege tax. The balance of severance tax collections, after making this distribution, was to be deposited each year in the state's general fund. (Effective from and after December 31, 1982.)

Laws of 1983, Chapter 4 changed the due date for payment of the Severance Tax to the twentieth day of the month following the month in which the tax accrues. Taxes were to be delinquent if not received by the Department of Revenue on the day preceding the last day of the month in which they were due. (Effective April 1, 1983.) The law also changed the interest rate on delinquent tax payments to equal the rate established by Section 6621 of the Internal Revenue Code, compounded annually. (Effective February 11, 1983.)

Legal Citation

A.R.S. 42-1461 - 42-1466.

Paid by

Persons engaged in the business of extracting substances from the earth that become metalliferous minerals (A.R.S. 42-1461 - 42-1462.)

Exemptions

None.

Severance Tax on Metalliferous Minerals
continued

Tax Base

The severance tax is levied on the "net severance base" of all metalliferous minerals produced after 1982. (42-1462) The "net severance base" is the greater of the following two values (42-1464, Laws of 1982, Chapter 230, Section 12):

1. The "weighted mineral value", or

2. A specified percentage of the old sales tax base (the gross value of production less out-of-state processing costs). This value will be referred to as the "Arizona value" after June 30, 1985.

The "weighted mineral value" is essentially the cost of extracting the minerals from the earth and delivering them to the site where they will be processed.
The "weighted mineral value" is determined using the following formula (42-1464):

$$\text{weighted mineral value} = \frac{\text{mining costs}}{\text{total production costs}} \times \text{gross value of production}$$

where:

mining costs represent the cost of extracting the minerals from the earth and delivering them to the site where they will be processed further (42-1461).

total production costs include most of the major costs incurred in mining and processing minerals until the point of sale (42-1461).

gross value of production is determined by multiplying the recoverable units of a metallic product by the per unit price of the product; the price per unit does not include the cost of manufacturing, fabricating or otherwise transforming a refined mineral product, when these activities occur prior to sale of the product (42-1461).

Although metalliferous minerals will no longer be taxed on the old sales tax base, the value of minerals produced after 1982 may not fall below a specified percentage of the old tax value. (42-1464, Laws of 1982, Chapter 230, Section 12). The old tax value included not only the cost of extracting the minerals from the earth, but most of the major in-state costs of producing the minerals. This value was determined by multiplying the recoverable units of a metallic product by the per unit price and deducting the out-of-state processing costs from the result. (42-1464; Laws of 1982, Chapter 230, Section 12; 41-1461). The following table shows the minimum percentage of the old tax value that may be assigned to minerals for severance tax purposes. (42-1464; Laws of 1982, Chapter 230, Section 12):

Severance Tax on Metalliferous Minerals
continued

Period during which minerals are produced	Minimum value of minerals for purposes of determining the severance tax
January 1, 1983 - June 30, 1983	100% of the old taxable sale value
July 1, 1983 - June 30, 1984	83-1/3% of the old taxable sale value
July 1, 1984 - June 30, 1985	66-2/3% of the old taxable sale value
July 1, 1985 and thereafter	50% of the old taxable sale value

Tax Rate

During fiscal years 1980-81, 1981-82 and 1982-83, businesses that produced mineral products were permitted to claim a tax credit against the Special Excise Tax for Education. The tax credit was determined by formula (see "TAX CREDIT" under "SPECIAL EXCISE TAX FOR EDUCATION"). The tax credit could not exceed the taxpayer's Special Excise Tax liability for the year. However, if a taxpayer had an unused amount of credit for any year in which his production was curtailed due to economic conditions, the unused credit could be carried forward for a period not to exceed three years. Since the Special Excise Tax does not apply to metalliferous minerals after December 31, 1982, businesses that produce metalliferous minerals are authorized to claim this tax credit against their severance tax liability, beginning in 1983. In 1982-83, the amount of credit claimed may not exceed 40 percent of the taxpayer's severance tax liability. (Laws of 1982, Chapter 228, Section 2; Laws of 1982, Chapter 230, Section 15)

Due Date

Collections from the severance tax on metalliferous minerals are due on the twentieth day of the month following the month in which the tax accrues. Taxes are delinquent if they are not received by the Department of Revenue on the day preceding the last day of the month in which they are due. The due date may be extended by the Department of Revenue for good cause, but not beyond the first day of the third month following the regular due date. (42-1465, 42-1322)

Collecting Agency

Department of Revenue. (42-1462, 42-101)

Dedication or Purpose

To aid in defraying the necessary and ordinary expenses of the state, cities, and counties to reduce or eliminate the annual tax levy on property for state, city and county purposes and to reduce the levy on property for public school education. (Laws of 1982, Chapter 230, Section 17)

Yield

No monies will be collected from this tax until fiscal year 1982-83.

Severance Tax on Metalliferous Minerals
continued

Distribution

Each year, a portion of severance tax collections will be distributed in the same manner as the transaction privilege tax (i.e. 25 percent to the cities, 33.6 percent to the counties and 41.4 percent to the state). The portion of collections that is distributed in this manner will increase each fiscal year until 1986-87. The table below shows the amount of severance tax collections that will be distributed in the same manner as transaction privilege taxes during each fiscal year. (42-1465, Laws of 1982, Chapter 230, Section 16)

period during which collections are received	portion of severance tax collections distributed in the same manner as the transaction privilege tax
January 1, 1983 - June 30, 1983	40%
July 1, 1983 - June 30, 1984	48%
July 1, 1984 - June 30, 1985	60%
July 1, 1985 and thereafter	80%

After making this distribution the balance of severance tax collections will be deposited each year in the state's general fund and is appropriated for public educational purposes. (42-1465; Laws of 1982, Chapter 230, Section 16)

Source: State of Arizona Tax Handbook - 1983
Prepared by the Staff of the Joint Legislative Budget Committee

INVENTORY TAX ON METALLIFEROUS MINERALS

Background

Laws of 1982, Chapter 230, Section 13, established an inventory tax on metalliferous minerals. The tax was to be imposed on each producer's 1982 year end inventory of mined metallic products. In determining the tax, producers were allowed to deduct the value of any inventory which had previously been taxed or was exempt from taxation under the sales tax laws of this state. The inventory tax was to be levied at a rate of 1-1/2 percent and was payable in twelve equal monthly installments. The first installment was to be paid to the Department of Revenue on or before March 6, 1983. Taxpayers who were not mining in January of 1983 could be granted a one month extension for each month after December that the mine did not produce. The due date for the first monthly installment could not, however, be extended for more than six months. Under the provisions of this law, 40 percent of collections from the inventory tax was to be distributed in the same manner as the transaction privilege tax. The remaining collections were deposited directly into the general fund. (Effective from and after December 31, 1982.)

Legal Citation

See Session Laws of 1982, Chapter 230, Section 13.

Paid By

Persons engaged in the business of extracting substances from the earth that become metalliferous minerals (Laws of 1982, Chapter 230, Section 13, 42-1461)

Exemptions

None

Tax Base

The Inventory Tax is levied on the "net severance base" of the 1982 year end inventory of all metalliferous minerals in this state. The net severance base is determined as follows:

1. Calculate the gross value of production for all metallic products in the 1982 year end inventory. The gross value of production is determined by multiplying the recoverable units of a metallic product by the per unit price of the product; the price per unit does not include the cost of manufacturing, fabricating or otherwise transforming a refined mineral product, when these activities occur prior to sale of the product.

2. Subtract the out-of-state processing costs from the gross value of production for all metallic products in the 1982 year end inventory. Out-of-state processing costs means processing costs incurred by the taxpayer out of this state, including freight charges for shipping metallic products out of state.

Inventory Tax on Metalliferous Minerals
continued

3. From the difference determined in step #2, deduct the value of metallic products that were previously taxed or were exempt from taxation under the sales tax laws of this state.

(Laws of 1982, Chapter 230, Section 13; 42-1461)

Tax Rate

Two and one-half percent of the net severance base. (Laws of 1982, Chapter 230, Section 13)

Tax Credit

During fiscal years 1980-81, 1981-82 and 1982-83, businesses that produced mineral products were permitted to claim a tax credit against the Special Excise Tax for Education. The tax credit was determined by formula (see "TAX CREDIT" under "SPECIAL EXCISE TAX FOR EDUCATION"). Since the Special Excise Tax does not apply to metalliferous minerals after December 31, 1982, businesses that produce metalliferous minerals are authorized to claim this tax credit against their inventory tax liability, for the remainder of the 1982-83 fiscal year. The amount claimed may not exceed 40 percent of the taxpayer's inventory tax liability. (Laws of 1982, Chapter 230, Section 15)

Due Date

Collections from the inventory tax on metalliferous minerals are payable in twelve equal monthly installments, with the first installment due on or before March 6, 1983. If a taxpayer was not mining in the month of January 1983, the Department is required to grant a one month extension of the date when the first monthly installment is due. For each subsequent consecutive month that a taxpayer does not mine, the Department is required to grant an additional one month extension. In no event shall the due date for the first monthly installment be extended for more than six months. (Laws of 1982, Chapter 230, Section 13)

Collecting Agency

Department of Revenue. (Laws of 1982, Chapter 230, Section 13)

Dedication or Purpose

To aid in defraying the necessary and ordinary expenses of the state, cities and counties, to reduce or eliminate the annual tax levy on property for state, city and county purposes and to reduce the levy on property for public school education. (Laws of 1982, Chapter 230, Section 17)

Yield

No monies will be collected from this tax until fiscal year 1982-83.

-continued-

Inventory Tax on Metalliferous Minerals
continued

Distribution

Of the total amount collected from the inventory tax on metalliferous minerals, 40 percent is to be distributed in the same manner as the transaction privilege tax and the balance is to be deposited in the state general fund. (Laws of 1982, Chapter 230, Section 16)

Source: State of Arizona Tax Handbook - 1983
Prepared by the Staff of the Joint Legislative Budget Committee

TABLE I

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1984

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
ANAMAX MINING COMPANY					
Eisenhower (Anamax share) 1/	None	None	None	None	None
Twin Buttes 2/	None	3,457,690 3/	50,239,238 4/	None	None
Precipitate Cu	--	--	--	--	--
Total	None	3,457,690	50,239,238	None	None
ASARCO, INC.					
Eisenhower (ASARCO share)	6,713,000	6,713,000	74,176,264	None	8,446,800
Mission	1,301,100	1,301,100	20,875,805	None	1,714,300
Sacaton 1/	1,000,400	1,000,400	8,992,771	None	99,600
San Xavier	2,328,000	2,328,000	18,865,587	None	4,594,200
Silver Bell 2/	2,255,300	2,272,300	23,612,754	None	2,643,530
Precipitate Cu	--	--	9,152,372 3/	None	--
Total	13,597,800	13,614,800	155,675,553	None	17,498,430

1/ Mine was operated by ASARCO entire year but Anamax did not receive any of the ore

2/ Mine was shut down all of 1984

3/ Mill feed from stockpiles only

4/ By solvent extraction/electrowinning

1/ Mine permanently shut down March 31, 1984

2/ Mine and concentrator were shut down August 15, 1984

3/ Precipitation operation continues

TABLE I (Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1984

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
CYPRUS MINES CORPORATION					
Bagdad 1/	4,444	4,300	37,014	710	4,044
Solvent extraction/electro-winning			13,502		
Johnson	52,100	--	8,803,361 3/	None	None
Pima 2/	--	--	--	--	--
Total	56,544	4,300	8,853,877	710	4,044
DUVAL CORPORATION					
Esperanza 1/	None	None	None	None	None
Precipitate Cu	--	--	8,499,621	--	--
Mineral Park 2/	None	None	None	None	None
Precipitate Cu	--	--	2,717,653	--	--
Sierrita	29,784,992	29,184,551	174,130,673 3/	16,872,868	22,731,698
Total	29,784,992	29,184,551	185,347,947	16,872,868	22,731,698

1/ Shut down 2/12/84 through 10/15/84. Production by SX/EW only during this period.

2/ Mine has been shut down since 1982

3/ By solvent extraction/electrowinning from oxide ore

1/ Mine was shut down without production in 1984

2/ " " " " " " " "

3/ Recoverable in concentrates

TABLE I (Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1984

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
INSPIRATION CONSOLIDATED COPPER CO.					
Christmas 1/	--	--	--	--	--
Inspiration	14,944,000	7,957,000	71,431,000 2/ 78,366,000 3/	25,000	25,671,000
Precipitate Cu			1,183,000		
Oxhide 4/	--	--	--	--	--
Total	14,944,000	7,957,000	150,980,000	25,000	25,671,000
KENNECOTT CORPORATION					
Ray Mines Division	11,756,179	9,581,161	174,553,544 1/	None	24,753,280
Precipitate Cu			20,457,133		
Total	11,756,179	9,581,161	195,010,677	None	24,753,280

1/ Shut down in 1984

2/ Pyrometallurgical smelting and electrolytic refining

3/ Solvent extraction/electrowinning

4/ Shut down in 1984

1/ Direct sales of concentrates

TABLE I (Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1984

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
MAGMA COPPER COMPANY					
San Manuel	20,333,923	20,373,506	226,186,000	4,029,900	None
Superior 1/	--	--	--	--	--
Total	20,333,923	20,373,506	226,186,000 2/	4,029,900	None

1/ Shut down during 1984

2/ Recovered from the San Manuel mine only

NORANDA LAKESHORE MINES, INC.					
Lakeshore	None	None	15,401,000 1/	None	None
Total	None	None	15,401,000	None	None

1/ In-situ leaching, solvent extraction/electrowinning

PHELPS DODGE CORPORATION					
Copper Queen Branch (Bisbee)	None	None	None	None	None
Precipitate Cu			3,492,614		

TABLE I (Cont)

COPPER AND MOLYBDENUM PRODUCTION OF LARGE ARIZONA COPPER MINES

1984

COMPANY/MINE	TONS COPPER ORE MINED	TONS COPPER ORE MILLED	POUNDS RECOVERABLE COPPER	POUNDS RECOVERABLE MOLYBDENUM	TONS WASTE/OVERBURDEN REMOVED
PHELPS DODGE CORPORATION (cont)					
Morenci and Metcalf	37,835,345	36,507,834	374,800,000 1/	587,452	34,086,925
Precipitate Cu			60,311,971		
New Cornelia Branch (Ajo)	5,792,638	5,719,299	47,642,226	164,556	3,381,917
Precipitate Cu			919,691		
Total	43,627,983	42,227,133	487,166,502	752,008	37,468,842
PINTO VALLEY COPPER CORPORATION					
Miami 1/	11,177,010	11,250,808	83,041,857 2/	382,617	8,874,810
			25,602,343 3/		
Total	11,177,010	11,250,808	108,644,200	382,617	8,874,810
TOTAL LARGE COMPANIES	145,278,431	137,650,949	1,583,504,994	22,063,103	137,002,104

1/ Source: Phelps Dodge 1984 Annual Report, p. 8

1/ Mine and mill started up late May, 1984 after being down for 23 months

2/ 7.2 months production from concentrates

3/ 12 months electrowinning production

Source: Personal correspondence with individual companies

TABLE II
ARIZONA LEACH COPPER PRODUCTION 1/

(Thousand Pounds)

MINE OPERATION	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
ANAMAX MINING COMPANY										
Twin Buttes	13,462	57,925	68,772	71,614	70,343	63,719	67,922	60,796	50,649	50,239
ASARCO INCORPORATED										
San Xavier 2/	19,384	22,772	12,860	15,183	--	--	--	--	--	--
Silver Bell	8,497	8,627	5,012	6,267	6,980	4,423	7,950	8,687	10,374	9,152
BIG HOLE MINING CO.										
United Verde	32	--	--	--	--	--	--	--	--	--
CYPRUS MINES CORP.										
Bagdad	14,321	14,606	15,011	14,097	14,337	12,668	13,244	13,173	13,282	14
Johnson	6,143	10,060	10,327	10,205	10,032	10,302	10,693	9,702	--	8,803
DUVAL CORPORATION										
Esperanza	3,960	6,412	8,636	7,469	6,002	9,991	11,566	9,354	6,367	8,500
Mineral Park	6,915	6,817	5,260	4,813	3,348	3,690	4,194	3,191	3,101	2,718
INSPIRATION CONSOLIDATED COPPER COMPANY										
Inspiration	52,470	45,545	20,883	35,945	16,638	28,958	50,532	50,000 (Est.)	78,988	79,549
Ox Hide	10,107	7,915	4,639	4,147	1,178	1,015	761	1,572	--	--
KENNECOTT CORPORATION										
Ray 3/	24,338	24,374	24,334	25,013	26,502	25,875	25,788	22,420	20,033	20,457
MCALESTER FUEL COMPANY										
Zonia	619	--	--	--	--	--	--	--	--	--
NORANDA LAKESHORE MINES, INC.										
Lakeshore	--	28,407	25,031	--	--	--	26,071	45,611	3,244	15,401

TABLE II
ARIZONA LEACH COPPER PRODUCTION 1/

(Thousand Pounds)

MINE OPERATION	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
PHELPS DODGE CORPORATION										
Copper Queen Branch 4/	8,377	7,893	8,526	7,932	7,316	6,052	4,600	4,545	5,200	3,493
Morenci Branch	23,778	53,136	41,545	51,362	93,983	86,840	96,090	75,735	69,158	60,312
New Cornelia Branch	--	--	--	--	--	--	--	661	--	920
PINTO VALLEY COPPER CORP.										
Copper Cities	3,562	3,370	3,346	3,806	4,351	3,984	3,622	2,046	--	--
Miami	13,076	13,509	11,732	11,703	12,636	11,184	10,217	10,301	9,289	25,602 7/
Pinto Valley	--	--	--	--	--	--	5,519	16,657	15,343	--
RANCHERS EXPLORATION & DEVELOPMENT CORPORATION (Now HECLA MINING CO.)										
Bluebird	15,122	17,876	17,069	3,926	10,955	13,017	13,328	NR	--	--
Old Reliable	467	--	--	--	1,005	1,128	149	--	--	--
TOTALS	224,630	329,244	282,983	283,482	285,606	282,846	352,246	334,451	285,028	285,160
PERCENT OF PRIMARY COPPER PRODUCED 5/, 6/	13.8	16.1	15.3	13.9	13.3	16.4	15.0	19.6	18.8	18.0

Source: Arizona Department of Mines and Mineral Resources; This report, Table I-II.

1/ Copper recovered from precipitate and/or by solvent extraction from material dump,heap, vat or in-situ leached.
2/ San Xavier discontinued production of siliceous flux and commenced production of copper precipitate as of 5/1/73.
3/ Includes only copper contained in precipitates from dump leaching. Does not include copper production by electrowinning.
4/ Lavender Pit and Copper Queen Mine.
5/ Leach copper compared to total copper produced from all primary sources as reported in "Minerals Yearbook - Area Reports: Domestic", U.S. Bureau of Mines for 1975-1978.
6/ Leach Copper compared to total copper produced as reported in Table I for 1979-1984.
7/ Combined Miami and Pinto Valley production.

TABLE III

RANK OF ARIZONA'S COPPER COMPANIES

BY PRODUCTION OF COPPER AND MOLYBDENUM

1984

Copper 1/			Molybdenum		
Rank	Company	% of AZ Production	Rank	Company	% of AZ Production
1	Phelps Dodge Corp.	30.77	1	Duval Corp.	76.48
2	Magma Copper Company	14.28	2	Magma Copper Company	18.27
3	Kennecott Corp.	12.32	3	Phelps Dodge Corp.	3.41
4	Duval Corp.	11.70	4	Pinto Valley Copper Corp.	1.73
5	ASARCO Inc.	9.83	5	Inspiration Cons. Copper Co.	0.11
6	Inspiration Cons. Copper Co.	9.54			
7	Pinto Valley Copper Corp.	6.86			
8	Anamax Mining Company	3.17			
9	Noranda Lakeshore Mines Inc.	0.97			
10	Cyprus Mines Corp.	0.56			
		100.00			100.00

Source: Arizona Department of Mines & Mineral Resources: This Report, Table I

1/ Precipitate and/or cathode copper included in production total where applicable.

TABLE IV
RANK OF ARIZONA'S COPPER MINES
BY PRODUCTION OF COPPER AND MOLYBDENUM 1984

RANK	COPPER 1/ Mine/Company Copper Produced, lb.	% of Ariz. Production	MOLYBDENUM Mine/Company Moly. Produced, lb.	% of Ariz. Production
1	Morenci-Metcalf/Phelps Dodge 435,111,971	27.48%	Sierrita/Duval 16,872,868	76.48%
2	San Manuel/Magma 226,186,000	14.28%	San Manuel/Magma 4,029,900	18.27%
3	Ray/Kennecott 195,010,677	12.32%	Morenci-Metcalf/Phelps Dodge 587,452	2.66%
4	Sierrita/Duval 174,130,673	11.00%	Miami/Pinto Valley 382,617	1.73%
5	Inspiration/Inspiration 150,980,000	9.53%	New Cornelia (Ajo)/Phelps Dodge 164,556	0.75%
6	Miami/Pinto Valley 108,644,200	6.86%	Inspiration/Inspiration 25,000	0.11%
7	Eisenhower/ASARCO 74,176,264	4.68%		
8	Twin Buttes/Anamax 50,239,238	3.17%		
9	New Cornelia (Ajo)/Phelps Dodge 48,561,917	3.07%		
10	Silver Bell/ASARCO 32,765,126	2.07%		
TOTAL	1,495,806,066	94.46%	22,062,393	100.00%

Source: Arizona Department of Mines & Mineral Resources; This Report, Table I

1/ Precipitate and/or cathode copper included in production total where applicable.

TABLE V
ARIZONA MINE PRODUCTION
OF RECOVERABLE COPPER IN SHORT TONS

	1980		1981		1982		1983		1984	
	Amount	% Change	Amount	% Change	Amount	% Change	Amount	% Change	Amount	% Change
					BY MONTH					
January	93.374	19.7%	92,769	(0.6)%	84,559	(8.7)%	68,560	(19.0)%	68,096	0.4%
February	86,313	11.1	88,061	2.0	82,181	(6.7)	54,455	(30.1)	62,432	9.8
March	96,558	9.9	94,366	(2.3)	90,488	(4.1)	66,475	(26.5)	66,058	0.4
April	93,363	4.0	95,002	1.8	87,385	(8.0)	61,841	(29.2)	61,076	(0.2)
May	95,749	3.9	97,306	1.6	73,434	(24.5)	63,699	(13.3)	66,125	4.9
June	85,210	0.9	93,704	10.0	67,208	(28.3)	65,449	(2.6)	71,133	9.8
July	36,218	(56.1)	95,125	162.6	60,795	(36.1)	54,653	(10.1)	70,235	29.9
August	25,211	(72.6)	101,909	304.2	56,753	(44.3)	52,118	(8.2)	70,019	35.8
September	25,237	(70.9)	98,489	290.3	55,942	(43.2)	64,852	15.9	69,528	8.3
October	49,574	(48.5)	103,774	109.3	61,588	(40.7)	64,049	4.0	73,316	15.8
November	75,745	(15.1)	102,832	35.8	68,010	(33.9)	69,886	2.8	73,541	6.3
December	86,357	(0.3)	83,962	(2.8)	60,307	(28.2)	65,366	8.4	68,901	4.8
					CUMULATIVE YEAR TO DATE					
January	93,374	19.7%	92,769	(0.6)%	84,659	(8.7)%	68,560	(19.0)%	68,096	0.4
February	179,687	15.4	180,830	0.6	166,840	(7.7)	126,015	(24.5)	130,528	4.7
March	276,245	13.4	275,196	(0.4)	257,328	(6.5)	192,490	(25.2)	196,586	3.2
April	369,608	10.9	370,198	0.2	344,713	(6.9)	254,331	(26.2)	257,662	2.4
May	465,357	9.4	467,504	0.5	418,147	(10.6)	318,030	(23.9)	323,787	2.9
June	550,567	8.0	561,208	1.9	485,355	(13.5)	383,479	(21.0)	394,920	4.1
July	586,785	(1.0)	656,333	11.9	546,150	(16.8)	438,132	(19.8)	465,155	7.3
August	611,996	(10.6)	758,242	23.9	602,903	(20.5)	490,250	(18.7)	535,174	10.3
September	637,233	(17.4)	856,731	34.4	658,845	(23.1)	555,102	(15.7)	604,702	10.1
October	686,807	(20.8)	960,505	39.9	720,433	(25.0)	619,151	(14.1)	678,018	10.7
November	762,552	(20.3)	1,063,337	39.4	788,443	(25.9)	689,037	(12.6)	751,559	10.2
December	848,909	(18.6)	1,147,299	35.1	848,750	(26.0)	754,403	(11.1)	820,460	9.7
Average Month	70,742	(18.6)%	95,608	35.2%	70,729	(26.0)%	62,867	(11.1)%	68,372	9.7%

NOTE: Percentage change column shows change from corresponding period in prior year. Parentheses indicate a negative change.
Source: U.S. Department of the Interior, Bureau of Mines.
Prepared By: State of Arizona Joint Legislative Budget Committee.
Date: February 26, 1985.

TABLE VI

AVERAGE COPPER CONTENT OF ORE PRODUCED AT ARIZONA COPPER MINES

(Percent Total Copper)

MINE OPERATION		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
ANAMAX MINING COMPANY 3/												
Twin Buttes	Sulfide	0.63	0.60	1.12	1.11	1.26	.94	.82	.74	.78	.67	-- 9/
	Oxide	--	1.27	1.31	1.30	1.26	1.27	1.26	1.20	1.06	.93	.861
ASARCO INCORPORATED												
Mission	Sulfide	.61	.60	.62	.58	.59	.60	.75	.75	(.75)	(.75)	(.75)
Sacaton	Sulfide	.63	.74	.71	.70	.67	.68	--	--	--	--	--
San Xavier	Sulfide	--	--	--	--	--	.80	.65	.65	(.65)	(.51)	(.51)
	Oxide 4/	.77	1.05	1.12	--	--	--	--	--	--	--	--
Silver Bell	Sulfide	.65	.72	.72	.65	.65	--	--	--	--	--	--
CYPRUS MINES CORPORATION												
Bagdad	Sulfide	.74	.70	.60	.59	.52	.50	.50	.50	.50	.50	.45
	Oxide	--	--	--	--	--	--	--	--	--	--	.22
Johnson	Oxide 1/	--	.42	.42	.46	.44	.40	.40	.40	.40	.40	0.71
Pima	Sulfide	.50	.48	.47	.48	--	.46	.49	.49	.48	--	--
DUVAL CORPORATION												
Esperanza	Sulfide	.31	--	.29	.29	--	--	.32	.29	.29	--	--
Mineral Park	Sulfide	.36	.30	.28	.28	.26	.24	.24	.32	--	--	--
	Oxide	--	--	--	--	--	--	--	--	--	--	--
Sierrita	Sulfide	.29	.33	.35	.34	.33	.34	.34	.30	.30	(.30)	.336
INSPIRATION CONSOLIDATED COPPER CO.												
Christmas (OP)	Sulfide	.57	.57	.58	.74	--	.74	.73	.62	.62	--	--
Inspiration Area	Sulfide	.63	.65	.63	.70	.61	.854	.58	.58	.58	.525	.55
	Oxide	--	--	--	--	--	--	--	--	--	--	.50
Ox Hide	Oxide 1/	--	.29	.27	.27	--	--	--	--	--	--	--
KENNECOTT CORPORATION												
Ray 5/	Sulfide	.83	.90	.86	.921	.856	.876	.910	.969	.80	1.187	1.134
	Oxide (Silicate)	1.19	1.231	1.15	--	--	--	--	--	--	--	--

(continued)

TABLE VI

AVERAGE COPPER CONTENT OF ORE PRODUCED AT ARIZONA COPPER MINES

(Percent Total Copper)

MINE OPERATION		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
MAGMA COPPER COMPANY												
San Manuel	Sulfide 2/	.70	.64	(.7)	(.7)	.64	.63	.65	.635	.66	0.64	.638
Superior	Sulfide	--	(4.5)	(4.5)	(4.5)	4.36	4.41	4.32	4.48	4.32	--	--
MCALESTER FUEL COMPANY												
Zonia	Oxide	--	(.53)	--	--	--	--	--	--	--	--	--
NORANDA LAKESHORE MINES INC.												
Lakeshore 6/	Sulfide	--	--	.75	.91	--	--	--	--	--	--	--
	Oxide 1/	--	--	1.03	.93	--	--	--	1.00	1.00	(1.00)	(1.00)
PHELPS DODGE CORPORATION												
Copper Queen	Sulfide	3.48	5.70	--	--	--	--	--	--	--	--	--
Lavender	Sulfide	.47	--	--	--	--	--	--	--	--	--	--
Metcalf	Sulfide	--	.84	.86	.70	.79	.78	.69	--	.78	.73 8/	.81 8/
	Oxide	--	--	--	--	--	--	--	--	--	--	--
Morenci	Sulfide	.82	.79	.80	.81	.80	.71	.82	.74	.72	.73 8/	.81 8/
	Oxide	--	--	--	--	--	--	--	--	--	--	--
New Cornelia	Sulfide	.57	.57	.66	.64	.59	.53	.51	.50	.64	.60	.548
PINTO VALLEY COPPER CORP.												
Miami East		--	--	--	--	--	--	--	--	--	--	--
Pinto Valley	Sulfide	--	(.45)	(.45)	.49	.52	.49	.49	.46	.46	--	.437
	Oxide	--	--	--	--	--	--	--	--	--	--	.017
RANCHERS EXPLORATION & DEVELOPMENT CORPORATION (Now Hecla Mining Co.)												
Bluebird	Oxide	--	.48	.58	.79	.70	.40	.40	.40	--	--	--
WEIGHTED AVERAGE SULFIDE GRADE 7/		.57	.56	.61	.57	.61	.64	.58	.58	.59	.65	.70

(continued)

TABLE VI

AVERAGE COPPER CONTENT OF ORE PRODUCED AT ARIZONA COPPER MINES

Source: Company annual reports, Form 10-K's and Prospectus; Personal correspondence and Arizona Department of Mines and Mineral Resources.

( ) Percentage in parenthesis is approximate: not used in calculation of weighted average.

1/ Acid soluble copper.

2/ Sulfide copper.

3/ Included ANAMAX share of Palo Verde deposit for 1979-1982.

4/ Copper bearing silica flux mines 1971-1972.

5/ Grade reported for Kennecott's Ray mine is an average of oxide and sulfide together for 1977 to 1982.

6/ The Lakeshore mine was owned and operated by the Hecla Mining Company in 1976 and 1977.

7/ Weighted average grade of ore milled, based generally on an assay of total copper.

8/ Based on combined Metcalf and Morenci mines production.

9/ Production totally by solvent extraction/electrowinning in 1984.

TABLE VII

PERCENT CONTAINED COPPER RECOVERED AT ARIZONA COPPER MINES 1/

(Percent of Total Copper)

MINE OPERATION		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
ANAMAX MINING COMPANY												
Twin Buttes 5/	Sulfide	71	63	68	87	76	85	87	85	--	--	--
	Oxide	--	65	75	76	79	78	76	77	--	--	80
									Total 87		(80 est.)	--
ASARCO INCORPORATED												
Mission	Sulfide	88	88	89	87	87	75	87	94	85	80	(80 est.)
Sacaton	Sulfide	78	82	82	82	83	78	--	--	--	--	--
San Xavier	Sulfide	--	--	--	--	--	82	66	76	78	79	(80 est.)
	Oxide	63	67	77	--	--	--	--	--	--	--	--
Silver Bell	Sulfide	78	77	81	78	78	--	--	--	--	--	--
CYPRUS MINES CORPORATION												
Bagdad	Sulfide	77	81	86	73	83	80	76	94	83	83	92
	Oxide	--	--	--	--	--	--	--	--	--	--	52
Johnson	Oxide 2/	--	43	91	90	96	79	86	86	--	62	(62 est.)
Pima	Sulfide	85	82	84	79	--	76	84	76	89	--	--
DUVAL CORPORATION												
Esperanza	Sulfide	89	90	91	85	--	--	90	87	--	--	--
Mineral Park	Sulfide	72	81	73	75	76	73	84	75	--	--	--
	Oxide	--	--	--	--	--	--	--	--	--	--	--
Sierrita	Sulfide	89	90	88	88	91	87	86	80	98(?)	(88 est.)	89
INSPIRATION CONSOLIDATED COPPER CO.												
Christmas (OP)	Sulfide	70	73	77	74	--	--	70	71	--	--	--
Inspiration Area 3/	Sulfide	48	46	45	54	55	53	81	74	68	86	80
	Oxide	--	--	--	--	--	--	--	--	--	--	--
Ox Hide	Oxide 2/	--	76	67	56	--	--	--	--	--	--	--
KENNECOTT CORPORATION												
Ray	Sulfide	--	--	--	--	--	--	--	70	70	(70 est.)	83

(Continued)

TABLE VII

PERCENT CONTAINED COPPER RECOVERED AT ARIZONA COPPER MINES

(Percent of Total Copper)

MINE OPERATION		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
MAGMA COPPER COMPANY												
San Manuel	Sulfide 4/	90	87	--	--	85	83	95	87	89	86	90
Superior	Sulfide	--	--	--	--	90	91	95	93	(93est)	--	--
NORANDA LAKESHORE MINES INC.												
Lakeshore	Sulfide	--	--	100	99	--	--	--	--	--	--	--
	Oxide 2/	--	--	98	100	--	--	--	92	--	--	--
PHELPS DODGE CORP.												
Copper Queen	Sulfide	90	92	--	--	--	--	--	--	--	--	--
Lavender	Sulfide	52	--	--	--	--	--	--	--	--	--	--
Metcalf	Sulfide	--	63	54	56	61	59	58	--	--	--	--
	Oxide	--	--	--	--	--	--	--	--	--	--	--
Morenci	Sulfide	74	70	70	72	77	68	64	69	68	71 7/	70 7/
	Oxide	--	--	--	--	--	--	--	--	--	--	--
New Cornelia	Sulfide	85	80	80	82	84	80	79	78	85	78	76
PINTO VALLEY COPPER COPPER CORP.												
Pinto Valley	Sulfide	--	--	--	92	89	84	83	94	95	--	88
RANCHERS EXPLORATION & DEVELOPMENT CORPORATION (Now Hecla Mining Co.)												
Bluebird	Oxide	--	34	36	38	85	36	41	156 6/	--	--	--

Source: Company Annual Reports and Form 10-K's, E&MJ International Directory; Arizona Dept. of Mines & Mineral Resources.

1/ Recoveries are based on available reported production and average grade of material treated. A number of oxide operations are not listed because of inadequate data.

2/ Percent recovery of acid soluble copper.

3/ Percent recovery in flotation-concentration treatment, after ore has been leached for 1971-1979.

4/ Percent recovery of sulfide copper.

5/ Recovery includes ANAMAX's share of Palo Verde 1979-1981-1982-1983-1984.

6/ Recovery by leaching heaps continued after mining was terminated in July, 1981.

7/ Includes Metcalf production.

TABLE VIII

STRIPPING RATIOS AT ARIZONA OPEN-PIT COPPER MINES 1/

(Waste:Ore)

MINE OPERATION	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
ANAMAX MINING COMPANY											
Twin Buttes	10.80:1	1.60:1 5/	5.50:1	5.60:1	2.00:1	2.90:1	3.32:1	3.62:1	2.05:1	1.14:1	-- 11/
ASARCO INCORPORATED											
Eisenhower 5/	--	--	--	--	--	--	--	.71:1	.67:1	0.57:1	1.26:1
Mission	2.30:1	1.50:1	1.50:1	2.30:1	2.30:1	0.76:1	3.05:1	2.01:1	1.62:1	2.52:1	1.32:1
Sacaton	--	6.30:1	5.90:1	4.40:1	2.70:1	3.10:1	2.02:1	1.30:1	.70:1	0.35:1	0.10:1
San Xavier	--	--	5.10:1	5.00:1	1.10:1	1.10:1	6.01:1	6.18:1	2.90:1	0.96:1	1.97:1
Silver Bell	3.40:1	2.00:1	1.60:1	1.80:1	1.40:1	1.50:1	--	1.41:1	--	1.09:1	1.17:1
CYPRUS MINES CORPORATION											
Bagdad	4.50:1	1.20:1	9.80:1	7.80:1	1.70:1	1.80:1	1.52:1	1.78:1	1.45:1	1.53:1	0.94:1
Johnson	--	0.56:1	1.50:1	1.60:1	2.50:1	1.30:1	2.01:1	1.52:1	-- 8/	0.03:1	--
Pima	2.80:1	2.00:1	2.00:1	1.60:1	--	5.20:1	6.28:1	3.06:1	1.42:1	-- 9/	-- 11/
DUVAL CORPORATION											
Esperanza	1.50:1	0.71:1	1.10:1	1.10:1	--	1.30:1	0.76:1	1.95:1	--	-- 9/	-- 11/
Mineral Park	0.90:1	0.66:1	2.10:1	1.60:1	1.50:1	1.70:1	1.71:1	1.44:1	--	-- 9/	-- 11/
Sierrita	1.70:1	1.40:1	1.50:1	1.60:1	1.30:1	1.10:1	1.11:1	.98:1	.55:1	0.33:1	0.76:1
INSPIRATION CONSOLIDATED COPPER COMPANY											
Christmas	5.10:1	3.40:1	3.10:1	4.40:1	--	--	4.40:1	3.24:1	--	-- 9/	-- 11/
Inspiration Area	2.20:1	3.10:1	1.90:1	2.40:1	2.80:1	3.40:1	2.40:1	1.53:1	1.42:1	0.27:1	1.72:1
Ox Hide	0.32:1	0.38:1	0.38:1	0.20:1	--	--	--	--	--	--	-- 11/
KENNECOTT CORPORATION											
Ray	3.00:1	3.50:1	2.60:1	2.50:1	3.10:1	2.70:1	3.15:1	1.88:1	2.30:1	2.72:1	2.106:1

(Continued)

TABLE VIII

STRIPPING RATIOS AT ARIZONA OPEN-PIT COPPER MINES 1/

(Waste:Ore)

MINE OPERATION	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
PHELPS DODGE CORPORATION											
Lavender	0.83:1	--	--	--	--	--	--	--	--	--	--
Metcalf	--	2.80:1	1.80:1	1.80:1	1.50:1	2.30:1	1.67:1	--	--	--	--
Morenci	2.00:1	1.80:1	1.30:1	1.50:1	1.50:1	1.40:1	1.30:1	1.63:1	.79:1	0.64:1 10/	0.90:1
New Cornelia	1.50:1	1.50:1	1.10:1	1.10:1	1.40:1	1.00:1	2.27:1 2/	.48:1 2/	1.21:1	0.30:1	0.58:1
PINTO VALLEY COPPER CORP.											
Pinto Valley	--	1.80:1	1.70:1	1.70:1	1.60:1	1.80:1	1.07:1	1.77:1	1.80:1	--	9/ 0.794:1
RANCHERS EXPLORATION & DEVELOPMENT CORPORATION (Now Hecla Mining Co.)											
Bluebird	1.30:1	1.30:1	1.80:1	3.30:1	1.50:1	1.50:1	1.50:1	.003:1	6/--	--	-- 11/
WEIGHTED AVERAGE*	2.70:1	3.03:1 4/	1.79:1	2.21:1	1.75:1	1.75:1	1.90:1	1.57:1	1.31:1	0.57:1	1.10:1

Source: "Minerals Yearbook - Area Reports: Domestic", U.S. Bureau of Mines; Company Annual Reports: E&MJ International Directory of Mining and Mineral Processing Operations; Arizona Department of Mines & Mineral Resources; Company submitted data for 1984.

1/ Leachable rock included with waste (except at solely leach operations).
2/ Includes preproduction stripping.
3/ Stripping continued as sulfide concentrator was shut down from March 1975 to January 1976.
4/ Without Twin Buttes the ratio would be 1.89:1.
5/ Mining is done by ASARCO, includes ANAMAX's share of ore.
6/ Stripping of overburden ceased in January but mining continued until July.
7/ Not used in calculation of weighted average.
8/ No stripping in 1982.
9/ No stripping in 1983.
10/ Combined Morenci and Metcalf.
11/ No stripping in 1984.

*NOTE: These are now weighted averages so use caution in making comparisons to the averages presented in previous editions of this report.

TABLE IX

ARIZONA PRODUCTION AND VALUE OF COPPER, MOLYBDENUM, GOLD AND SILVER

RECOVERED FROM COPPER ORE

Year	Copper Ore 1/ Tons	Gold 2/ Troy Ounces Value 5/	Silver 2/ Troy Ounces Value 6/	Molybdenum 3/ 1,000 lbs. Value (in $1,000)	Copper 4/ Pounds Value	Copper 4/ Lbs. Cu/ton ore Ave.¢/lb. 7/	Value of Copper Gold, Silver & Molybdenum
1970	150,240,842	107,292 $3,904,400	7,130,261 $12,626,700	15,672 $26,700	1,694,294,000 $ 977,608,000	11.28 57.700	$1,020,839,100
1971	149,293,547	93,617 $3,820,510	6,106,204 $ 9,437,479	22,684 $39,872	1,529,780,500 $ 786,812,004	10.25 51.433	$ 839,942,263
1972	165,914,825	102,526 $5,987,518	6,614,957 $11,143,226	27,126 $46,791	1,695,858,000 $ 858,392,446	10.22 50.617	$ 922,314,190
1973	181,311,945	102,376 $10,013,397	7,164,988 $18,325,173	37,657 $59,372	1,735,012,000 $1,021,314,814	9.57 58.865	$1,109,025,384
1974	178,913,296	90,206 $14,488,424	6,308,721 $29,701,332	28,346 $57,067	1,609,808,000 $1,233,901,735	9.00 76.649	$1,335,158,491
1975	168,750,152	82,759 $13,364,751	6,190,805 $27,354,196	25,030 $61,411	1,502,978,000 $ 954,917,072	8.91 63.535	$1,057,047,019
1976	194,136,559	97,961 $12,276,473	7,308,395 $31,816,805	31,073 $89,148	1,912,430,000 $1,316,210,823	9.85 68.824	$1,449,452,101
1977	168,641,401	87,874 $13,032,593	6,696,415 $30,957,660	34,574 $120,497	1,705,240,000 $1,122,184,339	10.11 65.808	$1,166,295,089
1978	178,204,491	92,508 $17,905,108	6,611,781 $35,709,502	33,029 $150,142	1,817,670,000 $1,190,755,617	10.20 65.510	$1,244,520,369
1979	203,977,408	99,549 $30,622,766	7,454,306 $82,699,941	35,101 $213,065	1,914,501,095 $1,767,735,441	9.39 92.334	$2,094,081,895

-continued-

TABLE IX

ARIZONA PRODUCTION AND VALUE OF COPPER, MOLYBDENUM, GOLD AND SILVER

RECOVERED FROM COPPER ORE

Year	Copper Ore 1/ Tons	Gold 2/ Troy Ounces Value 5/	Silver 2/ Troy Ounces Value 6/	Molybdenum 3/ 1,000 lbs. Value (in $1,000)	Copper 4/ Pounds Value	Copper 4/ lbs. Cu/ton Ore Ave. ¢/lb. 7/	Value of Copper Gold, Silver & Molybdenum
1980	169,650,401	71,533	5,640,703	36,299	1,521,850,812	8.97	
		$43,814,606	$116,376,559	$324,150	$1,543,400,219	101.416	$2,027,741,384
1981	216,787,430	95,496	7,565,368	35,600	2,143,898,000	9.89	
		$43,891,299	$ 79,575,340	$273,052	$1,795,385,941	83.744	$2,191,904,580
1982	146,124,870	61,050	6,301,000	22,099	1,697,500,000	11.62	
		$22,949,000	$ 50,090,000	$100,673	$1,261,415,000	74.31	$1,435,127,000
1983	152,902,150	61,991	4,492,000	23,934	1,495,208,000	9.78	
		$26,284,000	$ 51,383,000	$ 79,459	$1,144,285,000	76.53	$1,301,411,000
1984	145,278,431	51,548	4,068,000	23,184	1,582,549,000	10.89	
		$18,591,200	$ 33,557,000	$ 78,827	$1,044,483,000 P/	66.00	$1,175,458,200

Source: "Mineral Yearbook - Area Reports: Domestic", U.S. Bureau of Mines.

1/ Includes some copper-zinc, copper-lead, and/or lead-zinc ore in 1972 and thereafter.

2/ Excludes gold and silver recovered from vat or heap leaching of copper ores and from copper tailings or copper cleanup in 1969 and thereafter.

3/ Molybdenum content of recovered concentrate.

4/ Excludes precipitate copper from dump and in-place leaching prior to 1982.

5/ At average annual domestic, free market gold price in 1970 and thereafter: 1970, $36.39; 1971, $40.81; 1972, $58.40; 1973, $97.81; 1974, $159.73; 1975, $161.49; 1976, $125.32; 1977, $148.31; 1978, $193.55; 1979, $307.615; 1980, $612.509; 1981, $459.614; 1982, $375,905; 1983, $423.997; 1984, $360.658.

6/ At E&MJ average annual N.Y. market price for .999 fine silver.

7/ At E&MJ average annual price, domestic FOB refinery.

P/ Preliminary.

TABLE X

NONFUEL MINERAL PRODUCTION IN ARIZONA 1/

MINERAL	1983r/		1984p/	
	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays----------thousand short tons---------	151	$ 1,425	137	$ 886
Copper (recoverable content of ores, etc.) short tons--	747,604	1,144,285	763,696	1,100,182
Gem stones----------	NA	2,800	NA	2,800
Gold (recoverable content of ores, etc.) troy ounces---	61,991	26,284	51,548	18,591
Gypsum----------thousand short tons----------	265	1,929	294	2,411
Lead (recoverable content of ores, etc.) short tons----	159	69	W	W
Lime----------thousand short tons---------	340	16,700	372	19,716
Molybdenum (content of concentrate) thousands pounds---	23,934	79,459	23,184	78,827
Pumice----------thousand short tons---------	2	15	2	18
Sand and gravel-construction---------do----------	e/ 23,200	e/ 75,000	25,200	74,500
Silver (recoverable content of ores, etc.) thousand troy ounces--------	4,492	51,383	4,093	33,320
Stone:				
Crushed----------thousand short tons---------	4,755	24,079	5,500	26,800
Dimension----------do----------	W	1	(2/)	(2/)
Combined value of cement, perlite, pyrites, salt, sand and gravel (industrial), tin (1984), and values indicated by symbol W.	XX	87,449	XX	118,323
Total	XX	1,510,878	XX	1,476,374

Source: "The Mineral Industry of Arizona in 1984." Mineral Industry Surveys, U.S. Bureau of Mines.

p/ Preliminary
e/ Estimated
r/ Revised
NA Not Available
W Withheld to avoid disclosing company proprietary data; value included in "Combined Value" figure.
XX Not Applicable.
1/ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
2/ Less than ½ unit.

TABLE XI

COPPER MINE CAPACITY IN ARIZONA 1/
(Short tons of Recoverable Copper/Year)

OPERATOR	MINE	CAPACITY
Phelps Dodge	Morenci/Metcalf	220,000
Anamax	Twin Buttes	135,000 2/
Magma	San Manuel	126,000
Kennecott	Ray	114,000
Duval	Sierrita	102,000
Pinto Valley Copper	Pinto Valley	85,000
Cyprus	Bagdad	85,000
Inspiration	Inspiration Area	55,000
Cyprus	Pima	45,000
Magma	Superior (Magma)	42,500
Phelps Dodge	New Cornelia	40,000
ASARCO 3/	Mission	35,000
Duval	Esperanza	22,500
Duval	Mineral Park	17,000
Noranda	Lakeshore	16,000
ASARCO 3/	Eisenhower	13,000
ASARCO 3/	San Xavier	9,000
Inspiration	Christmas	8,500
Pinto Valley Copper	Miami	6,000
Cyprus	Johnson	5,500
Inspiration	Ox Hide	2,500
Pinto Valley Copper	Copper Cities	2,000
Phelps Dodge	Copper Queen/Lavender	1,700
	TOTAL	1,188,200

Source: Arizona Department of Mines & Mineral Resources file data; Company Annual Reports and Form 10-K; Professional Publications.

1/ Figures generally represent a current estimate of the productive capacity of primary recoverable copper in concentrates, precipitates, and cathodes. Figures do not represent smelter or refinery capacity. The estimates are based on recent production figures and on capacities of concentrator and leach plant facilities. Other factors affecting actual production include, for example, grade of ore and recovery. Some capacities have been published by the reporting company.

2/ Includes approximately 33,000 tons of copper concentrated annually from ore obtained at the Eisenhower mine.

3/ The Mission mill treats ore from the Mission, San Xavier and ASARCO's share of Eisenhower mine production.

TABLE XII

MINE PRODUCTION OF COPPER IN THE UNITED STATES

Short Tons

	1980	1981	1982	1983	1984
Arizona	848,909	1,147,299	848,251	747,604	824,486
Idaho	3,420	4,679	3,389	3,920	4,113
Missouri	14,965	9,272	8,753	8,515	(b)
Montana	41,611	68,878	71,596	36,748	19,502
New Mexico	164,679	169,881	(b)	(b)	(b)
Utah	173,917	232,892	208,436	187,118	(b)
Other States (a)	54,455	62,628	123,897	160,401	350,085
TOTAL	1,301,956	1,695,529	1,264,322	1,144,306	1,198,186

Source: American Bureau of Metal Statistics, Inc. Non-Ferrous Metal Data 1984, p. 25.
Derived from U. S. Bureau of Mines data.

(a) Includes California, Colorado, Maine, Michigan, Nevada, Oregon, Tennessee and Washington.
(b) Included in "Other States".

TABLE XIII

COPPER SMELTERS IN NORTH AMERICA

End of 1984-Short Tons

Company	Location Of Plant	Annual Capacity
	United States	
ASARCO Incorporated	Hayden, Ariz.	940,000
	El Paso, Texas	576,000
	Tacoma, Wash.	(c)
Chemetco Inc.	Alton, Illinois	150,000
Copper Range Company		
White Pine Copper Division	White Pine, Mich.	70,000
Inspiration Consolidated		
Copper Company	Inspiration, Ariz.	450,000
Kennecott		
Chino Mines Company	Hurley, N.M.	500,000
Nevada Mines Division	Mcgill, Nev.	255,000
Ray Mines Division	Hayden, Ariz.	360,000
Utah Copper Division	Garfield, Utah	820,000
Magma Copper Company		
San Manuel Division	San Manuel, Ariz.	800,000
Phelps Dodge Corporation		
Douglas Smelter	Douglas, Ariz.	500,000
Morenci Branch	Morenci, Ariz.	650,000
New Cornelia Branch	Ajo, Ariz.	190,000
Tyrone Branch	Playas, N.M.	750,000
Tennessee Chemical Company	Copperhill, Tenn.	18,000
United States Metals Refining		
Co., A Subsidiary Of AMAX Inc.	Carteret, N.J.	250,000
Total (a)		**7,279,000**
	Canada	
Falconbridge Ltd.	Falconbridge, Ont.	700,000
Gaspe Mines	Murdochville, Que.	357,000
Hudson Bay Mining & Smelting		
Company Ltd.	Flin Flon, Manitoba	350,000
Inco Ltd.	Copper Cliff, Ont.	2,400,000
Noranda Mines, Ltd.	Noranda, Que.	1,000,000
Total (a)		**4,807,000**
	Mexico	
Cia. Minera De Santa Rosalia, S.A.	Santa Rosalia, Baja, Calif.	100,000
Compania Minera De Cananea, S.A.	Cananea, Son.	277,000
Industrial Minera Mexico, S.A.	San Luis Potosi	300,000
Total (a)		**677,000**

Source: American Bureau of Metal Statistics Inc.
The capacity of copper smelting works is given as estimated by the respective proprietors.
(a) Tons of material.
(b) Tons of product.
(c) Smelting operations are expected to cease in early 1985.

(continued next page)

TABLE XIV

Copper Production Of Companies (g)

Short Tons

	1980	1981	1982	1983	1984
			United States		
Anaconda Copper Company (own mines) (d)	92,718	149,257	164,291	43,243	14,933
Anamax Mining Company	115,282	135,175	145,290	49,108	25,709
ASARCO Incorporated	56,444	112,694	119,615	110,746	103,710
Cominco American Incorporated And Dresser Minerals (e)	2,813	2,058	2,033	869	1,045
Copper Range Company White Pine Copper Division (f)	35,770	43,362	22,600	26,575	24,761
Cyprus Bagdad Copper Company	63,960	71,507	86,623	81,033	23,876
Cyprus Johnson Copper Company	5,151	5,347	4,851	4,859	4,401
Cyprus Pima Mining Company	27,966	40,832	20,201	–	–
Day Mines Inc.	1,996	(l)	(l)	(l)	(l)
Coeur Mines	55	(l)	(l)	(l)	(l)
Galena Mine	261	(l)	(l)	(l)	(l)
Victoria Mine	1,680	(l)	(l)	(l)	(l)
Duval Corporation	144,640	130,555	58,027	71,510	92,204
Hecla Mining Company (a)	494	1,566	1,159	1,283	742
Coeur Mine (j)	n.a.	59	60	56	61
Consolidated Silver (m)	3	43	2	–	–
Galena Mine (k)	n.a.	316	330	307	172
Lucky Friday Mine	442	374	666	756	442
Sunshine Mine	52	235	101	164	67
Victoria Mine	n.a.	539	–	–	–
Inspiration Consolidated Copper Company (f)	40,812	64,700	54,699	40,778	44,112
Kennecott (U.S. mines)	335,914	372,213	285,716	318,000	303,000(o)
Magma Copper Company (f)	99,340	165,560	132,374	99,705	120,345
Superior Division	22,969	42,462	25,633	–	–
San Manuel Division	76,371	123,098	106,741	99,705	120,345
Noranda Lakeshore Mines, Inc. (b)	–	13,035	22,800	18,760	7,701
Phelps Dodge Corporation (U.S. mines) (b)	267,800	315,700	150,100	263,100	331,232
Pinto Valley Copper Corporation	52,819	92,311	56,848	10,264	56,507
Ranchers-Exploration And Development Corp. (n)	7,115	6,663	3,998	–	–
Bluebird Mine	6,550	6,663	3,998	–	–
Old Reliable Mine (i)	565	–	–	–	–
Tennessee Chemical Company	10,938	12,619	11,685	11,725	9,245
Refiners (c)	380,314	529,087	465,987	401,567	451,603
AMAX Copper, Inc.	155,581	169,275	147,509	126,799	105,226
ASARCO Incorporated	224,733	359,812	318,478	274,768	346,377

(a) Includes Hecla's share of production from each mining property.
(b) Includes copper produced from purchased ores.
(c) The totals for these concerns are to a large extent duplications of the reports of other producers.
(d) Includes Anaconda's 50% share of Anamax Mining Company.
(e) Magmont mine.
(f) Refined production.
(g) Copper content of mine production unless otherwise noted.
(h) Mine abandoned in 1979.
(i) Mine abandoned in 1981.
(j) Operated by ASARCO - Shows Hecla Mines share of 5%.
(k) Operated by ASARCO - Shows Hecla Mines share of 25%.
(l) On October 20, 1981, Day Mines, Inc. merged into a subsidiary of Hecla Mining Company.
(m) Operated by Hecla Mining Company - Shows Hecla's 64% share.
(n) Ranchers was merged into Hecla Mining Company in 1984. Production at the Bluebird was discontinued in 1982 and the property has been sold.
(o) Reported production of refined copper plus unrefined copper sales. Includes only Kennecott's share from jointly owned properties.

(continued next page)

Source; Non-Ferrous Metal Data 1984, p. 22. American Bureau of Metal Statistics Inc.

TABLE XV

Imports Of Copper Into The United States

Short Tons

	1980	1981	1982	1983	1984
Ore, Matte And Regulus, Copper Content	16,007	36,036	108,133	102,807	16,518
Unrefined Black, Blister & Converter Copper In Pigs, Bars, Etc.	51,780	81,268	114,021	87,588	66,340
Refined Copper In Cathodes, Ingots, Plates, Or Bars	504,983	391,208	313,909	532,399	555,968
Waste & Scrap (unalloyed)	17,696	19,443	18,056	25,450	25,362
Waste & Scrap (alloyed)	14,887	19,334	20,760	34,597	34,267

Source: U.S. Bureau of the Census

Exports Of Copper From The United States

Short Tons

	1980	1981	1982	1983	1984
Ore, Concentrates & Unrefined, Copper Content	117,755	166,207	215,256	47,110	67,240
Refined In Ingots, Bars Or Other Forms	18,938	30,946	38,554	96,482	103,532
Refined Copper (re-exports)	4,910	35,081	1,178	718	1,050
Waste & Scrap (a)	67,489	55,202	59,987	52,897	89,075
Pipes & Tubes (a)	19,458	12,059	5,047	3,991	4,270
Plates & Sheets (a)	2,032	2,573	13,038	1,511	5,122
Wire & Cable, Bare	6,937	7,742	8,326	9,163	9,677
Semi-Fabricated Forms	45,272	20,338	19,394	10,405	13,338
Insulated Copper Wire & Cable (b)	69,727	89,538	70,070	67,714	65,136

Source: U.S. Bureau of the Census.
(a) Metal weight, chiefly copper
(b) Gross weight.

Imports Of Copper Into The United States By Countries

Short Tons

	1980	1981	1982	1983	1984
Ore, Matte And Regulus					
Canada	2,720	2,393	22,850	41,304	4,084
Mexico	25	12,412	57,814	34,350	249
Honduras	–	–	–	2,260	254
Bolivia	–	–	14	26	–
Chile	515	217	5,423	7,596	2,597
Peru	1,440	3,115	1,093	4,407	1,175
Netherlands	–	–	–	433	166
India	–	–	–	–	3
Japan	–	–	–	11	218
Philippines	9,807	16,921	17,605	9,270	6,313
Saudi Arabia	–	60	–	–	–
Taiwan	–	–	–	–	18
Botswana	–	–	–	1	–
South Africa	–	–	59	363	–
Zimbabwe	–	–	6	–	–
Australia	1,500	918	3,269	2,786	1,441
Total	**16,007**	**36,036**	**108,133**	**102,807**	**16,518**

(continued next page)

Imports Of Copper Into The United States By Countries (continued)

Short Tons

	1980	1981	1982	1983	1984
Unrefined Black, Blister And Converter Copper In Pigs, Bars, Etc.					
Canada	4,358	27	29,542	4,547	5
Mexico	1,022	8,046	4,772	10,206	7,610
Argentina	–	–	–	1,808	–
Chile	21,197	41,825	67,172	66,255	51,555
Peru	17,675	17,799	11,213	3,803	6,902
Belgium	35	23	1,147	–	–
Germany, F.R.	–	38	116	19	76
Sweden	–	1,087	–	–	–
United Kingdom	–	20	11	–	–
Japan	2,999	3,855	–	–	–
Egypt	–	–	–	854	–
Australia	4,494	8,548	–	–	–
Other Countries	–	–	48	96	192
Total	**51,780**	**81,268**	**114,021**	**87,588**	**66,340**
Cathodes, Ingots, Plates, Or Bars					
Canada	144,263	93,548	72,046	100,669	202,957
Mexico	2,878	4,816	3,111	–	–
Argentina	551	1,102	–	–	–
Chile	117,471	149,480	182,003	297,368	169,826
Peru	38,776	52,576	14,920	34,458	58,509
Belgium	–	2,133	1,166	6,363	13,359
Finland	–	–	–	78	139
France	40	60	–	20	63
Germany, F.R.	445	145	7	1,097	441
Italy	–	–	–	21	20
Netherlands	–	–	–	40	80
Norway	533	416	2,265	279	1,959
Spain	88	–	–	–	–
Sweden	20	20	20	–	–
United Kingdom	60	643	358	346	41
Yugoslavia	5,006	2,698	–	–	–
Japan	115,448	7,062	15	10,120	4,163
South Korea	–	–	2,205	3,307	910
Philippines	–	–	–	–	1,050
Ghana	–	–	–	3,816	–
South Africa	2,396	–	–	15,114	555
Zaire	5,517	27,212	24,535	32,082	30,907
Zambia	71,491	49,144	10,368	27,221	64,501
Australia	–	–	–	–	3,270
U.S.S.R.	–	–	728	–	–
Hungary	–	–	60	–	–
Other Countries	–	153	102	–	3,218
Total	**504,983**	**391,208**	**313,909**	**532,399**	**555,968**

Source: U.S. Bureau of the Census.

TABLE XVI

"COVERED EMPLOYMENT" AND WAGES IN ARIZONA COPPER MINING AND SMELTING

Year	Average No. Covered Employees 1/	Total Wages	Average Annual Wage	Average Weekly Wage	Tons Copper Ore
1948	11,493	$ 41,318,524	$3,595	$ 69.13	39,072,204
1949	11,001	40,612,224	3,692	71.00	37,365,611
1950	10,181	41,994,321	4,125	79.33	41,757,273
1951	10,754	47,825,698	4,447	85.52	42,784,388
1952	11,365	54,950,235	4,835	93.14	44,472,522
1953	12,068	62,742,982	5,199	99.98	45,187,838
1954	12,502	65,518,853	5,241	100.79	43,072,894
1955	12,399	71,293,263	5,750	110.58	52,189,728
1956	14,008	83,568,996	5,966	114.73	60,468,580
1957	14,652	85,125,320	5,809	111.71	59,571,834
1958	14,100	74,726,972	5,300	101.93	56,255,809
1959	11,568	72,095,130	6,232	119.85	53,121,545
1960	13,764	90,312,848	6,562	126.19	66,032,439
1961	14,275	97,271,286	6,814	131.04	71,918,991
1962	14,408	101,920,108	7,074	136.04	78,868,147
1963	14,303	104,291,588	7,292	140.23	80,615,132
1964	14,720	113,792,031	7,730	148.65	86,132,039
1965	15,239	122,163,124	8,016	154.16	92,859,535
1966 1/	17,018	137,187,611	8,061	155.02	101,558,298
1967	13,426	108,427,206	8,076	155.31	74,289,203
1968	15,734	136,089,579	8,649	166.33	101,293,963
1969	19,459	173,183,018	8,900	171.15	127,848,828

-continued-

TABLE XVI continued

"COVERED EMPLOYMENT" AND WAGES IN ARIZONA COPPER MINING AND SMELTING

Year	Average Covered Employees 1/	Total Wages	Average Annual Wage	Average Weekly Wage	Tons Copper Ore
1970	21,479	$ 201,665,064	$ 9,389	$180.56	150,241,000
1971	21,231	211,978,597	9,984	192.00	149,294,000
1972	23,233	254,717,341	10,964	210.85	165,914,825 2/
1973	25,494	291,294,328	11,426	218.89	181,311,945
1974	27,894	340,832,096	12,219	234.98	178,913,296
1975	25,950	363,349,178	14,002	269.27	168,750,152
1976	25,631	405,289,034	15,812	304.08	194,136,559
1977	23,373	398,539,789	16,835	323.75	168,641,401
1978	21,092	397,790,419	18,860	362.69	178,204,491
1979	23,239	494,963,476	21,299	409.60	203,997,408
1980	21,602	510,168,454	23,617	454.17	169,650,401
1981	26,031	687,434,798	26,408	507.85	216,787,430
1982	17,182	487,415,292	28,368	545.53	135,768,647
1983	13,864	395,266,852	28,510	548.29	135,301,652
1984	12,556	387,028,537	30,824	592.77	145,278,431

Source: This report, Table XVII; "Minerals Yearbook - Area Reports: Domestic", U.S. Bureau of Mines; Research and Statistics Unit, Arizona Department of Economic Security.

1/ "Covered Employment" by law includes all employees of employers of three or more persons. Prior to 1966 only a portion of the workers in smelting, refining, and rod fabrication were included in this table.

2/ Mine production in short tons of lode ore from "Arizona, Mine Production by Class of Ore", reported by U.S. Bureau of Mines. In 1982 and thereafter the tonnage may include copper-zinc, copper-lead and lead-zinc ore combined to avoid disclosing individual company confidential data.

TABLE XVII

ARIZONA INDUSTRIES COVERED BY SOCIAL SECURITY

YEAR - 1984

Industry	Average Number of Employees 1/	Total Wages	Average Annual Wage	Average Weekly Wage
Copper Mining	10,294	314,791,708	30,580	588.08
Copper Smelting, Refining & Rod Fabrication	2,262	72,236,829	31,935	614.13
TOTAL COPPER MINING & PROCESSING	12,556	387,028,537	30,824	592.77
Other Mining, Quarrying & Processing	2,906	78,901,057	27,151	522.13
ALL MINING, QUARRYING & PROCESSING	15,462	465,929,594	30,134	579.50
Mfg. Except Copper Processing	170,429	3,839,290,009	22,527	433.21
Construction	99,067	1,864,652,206	18,822	361.96
Transportation, Utilities, etc 2/	51,498	1,190,285,745	23,113	444.48
Wholesale-Retail Trade	285,877	3,675,866,425	12,858	247.27
Services, Finance & Misc.	333,456	5,301,112,378	15,897	305.72
Agriculture & Related Services	28,973	303,743,894	10,484	201.61
Federal, State & Local Government	196,753	3,813,018,725	19,380	372.69
TOTAL AND AVERAGES	1,181,515	20,453,898,976	17,312	332.92

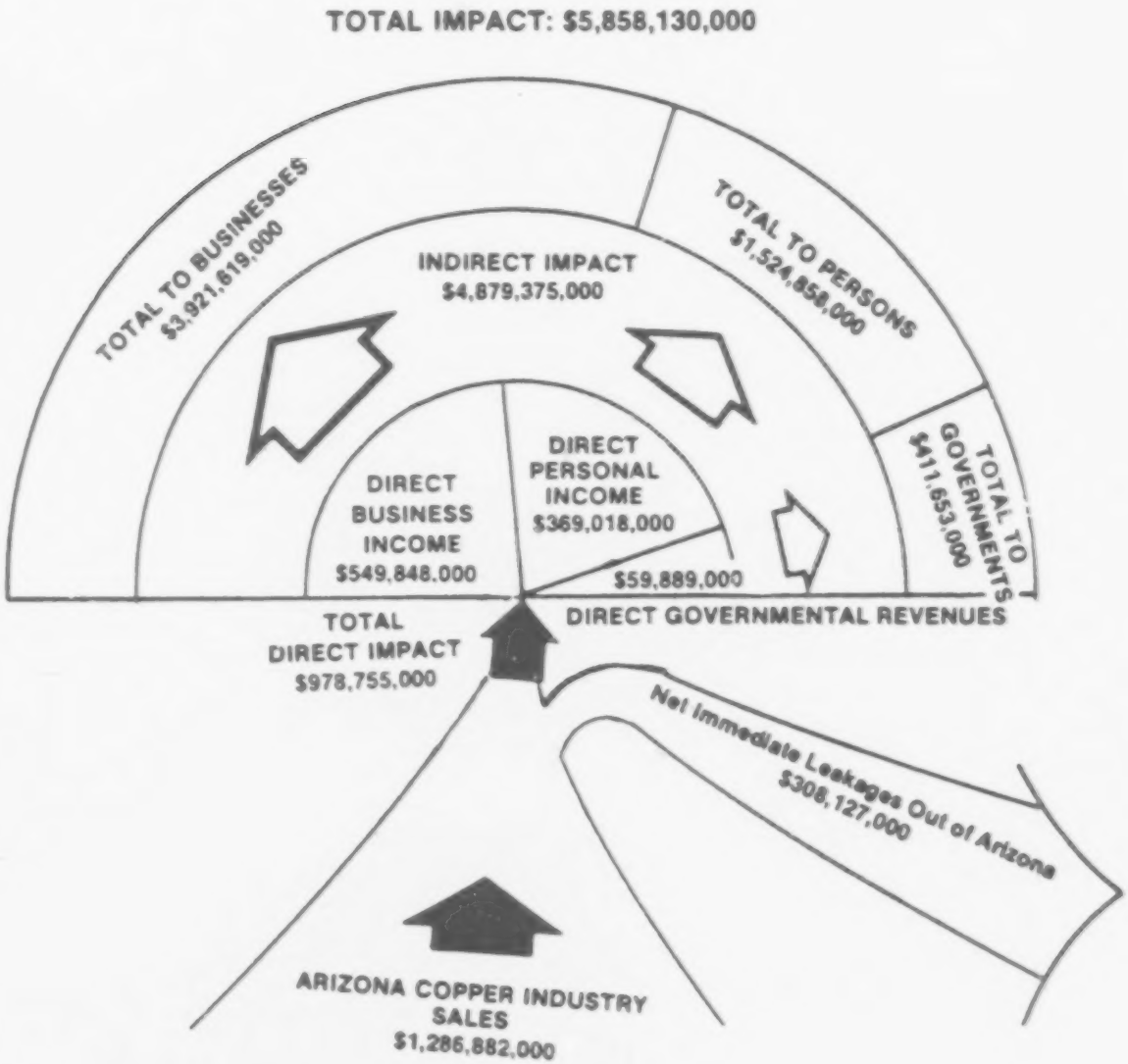
Source: Research and Statistics Unit, Arizona Department of Economic Security

1/ Includes all covered employees.

2/ Transportation exclusive of railroads.

TABLE XVIII

DIRECT AND INDIRECT IMPACTS OF THE COPPER INDUSTRY ON THE ARIZONA ECONOMY 1984



Circulation and recirculation of the direct impact of copper industry spending creates a "ripple effect" that expands the direct economic impact of the copper industry in Arizona to a total impact that is six times greater than the direct impact.

Source: "The Copper Industry's Impact on the Arizona Economy—1984," by George F. Leaming. Western Economic Analysis Center, Marana, Arizona, P. iv.

TABLE XIX

EMPLOYMENT, EARNINGS AND HOURS IN COPPER MINING

IN THE UNITED STATES AND ARIZONA 1/

Period	All Employees: Average No. (Thousands) 2/ Ariz.	All Employees: Average No. (Thousands) 3/ U.S.	PRODUCTION WORKERS: Average No. (Thousands) 4/ Ariz.	PRODUCTION WORKERS: Average No. (Thousands) 5/ U.S.	Average Weekly Earnings Ariz.	Average Weekly Earnings U.S.	Average Weekly Hours Ariz.	Average Weekly Hours U.S.	Average Hourly Earnings 6/ Ariz.	Average Hourly Earnings 6/ U.S.	Average Earnings Per Man Per Year 7/ Ariz.	Average Earnings Per Man Per Year 7/ U.S.	Aggregate Man-Hours (Thousands) 8/ Ariz.	Aggregate Man-Hours (Thousands) 8/ U.S.
1970	18.8	37.0	14.9	29.5	173.01	175.67	43.8	44.7	3.95	3.93	8,997	9,135	33,936	68,570
1971	18.9	34.7	14.9	26.8	178.50	178.46	42.4	42.9	4.21	4.16	9,282	9,280	32,852	59,785
1972	20.5	38.9	16.1	30.7	194.69	192.19	41.6	41.6	4.68	4.62	10,124	9,994	34,827	66,410
1973	21.5	42.3	17.6	33.7	206.75	206.42	41.6	42.3	4.97	4.88	10,751	10,734	38,072	74,127
1974	24.0	42.8	19.1	33.8	222.16	226.46	39.6	41.1	5.61	5.51	11,552	11,776	39,331	72,237
1975	22.5	37.1	17.9	28.4	247.43	247.14	38.6	39.2	6.41	6.33	12,866	12,903	35,929	57,891
1976	21.7	35.5	17.2	27.0	286.31	280.70	40.1	40.1	7.14	7.00	14,888	14,596	35,865	56,300
1977	19.3	35.1	15.3	26.9	302.99	288.73	39.4	38.6	7.69	7.48	15,755	15,014	31,347	53,994
1978	17.2	35.2	13.7	26.9	344.76	338.40	40.8	40.0	8.45	8.46	17,928	17,597	29,066	55,952
1979	19.3	31.9	15.3	24.6	404.81	405.03	42.3	42.5	9.57	9.53	21,050	21,061	33,654	54,366
1980	17.7	29.4	14.0	22.6	446.19	435.01	41.7	41.0	10.70	10.61	23,202	22,621	30,358	48,183
1981	21.9	36.2	17.4	27.9	497.28	492.54	41.2	41.6	12.07	11.84	25,859	25,612	37,278	60,353
1982	15.2	25.3	12.1	18.5	495.60	484.91	38.3	38.7	12.94	12.53	25,771	25,215	24,098	37,229
1983	11.3	19.8	9.0	14.2	519.25	522.69	39.1	39.9	13.28	13.10	27,001	27,180	18,299	29,462
1984	10.5	17.3	8.2	12.1	553.83	562.74	41.3	41.5	13.41	13.56	28,799	29,002	17,610	26,112

TABLE XIX CONTINUED

EMPLOYMENT EARNINGS AND HOURS IN COPPER MINING

IN THE UNITED STATES AND ARIZONA

	Copper Ore Mined (Thousand Short Tons)		Copper Produced (Recoverable Content) (Thousand Pounds)		Worker Productivity: Copper Ore Mined per man-hour (tons)		Worker Productivity: Copper Produced per man-hour (pounds)	
Period	Ariz.	U.S.	Ariz.	U.S.	Ariz.	U.S.	Ariz.	U.S.
1970	150,241	257,729	1,826,734	3,368,957	4.427	3.759	53.829	49.132
1971	149,294	242,656	1,633,568	2,986,599	4.544	4.059	49.725	49.996
1972	165,815	266,831	1,816,118	3,264,113	4.761	4.017	52.161	49,151
1973	173,605	289,998	1,847,635	3,386,357	4.872	3.912	48.530	45.683
1974	178,821	293,443	1,710,744	3,145,148	4.547	4.062	43.496	43.539
1975	168,656	263,003	1,619,535	2,772,111	4.694	4.543	45.076	47.885
1976	194,046	283,736	2,043,168	3,166,889	5.410	5.040	56.968	56.250
1977	168,601	259,974	1,843,949	2,964,539	5.379	4.815	58.824	54.905
1978	178,201	263,722	1,965,072	2,955,210	6.131	4.713	67.607	52.817
1979	203,977	291,078	2,085,556	3,140,110	6.061	5.369	61.971	57.759
1980	169,650	241,090	1,669,495	2,527,920	5.588	5.004	54.994	52.465
1981	216,787	306,089	2,294,437	3,354,548	5.815	5.072	61.549	55.582
1982	146,125	200,589	1,697,500	2,507,070	6.064	5.388	70.442	67.342
1983	152,902 1/	196,203 2/	1,514,538 1/	2,288,612	8.356	6.660	82,766	77.680
1984	145,278 1/	189,499	1,583,505 1/	2,405,866	8.250	7.257	89.921	92.136

Source: Research and Statistics Unit, Arizona Department of Economic Security; "Minerals Yearbook - Metals, Minerals," U.S. Bureau of Mines. "Employment and Earnings", March issues, U.S. Department of Labor.

1/ Table I this publication.

2/ U.S. Bureau of Mines

TABLE XIX CONTINUED

EMPLOYMENT, EARNINGS AND HOURS IN COPPER MINING

IN THE UNITED STATES AND ARIZONA 1/

1/ Statistics do not reflect workers in copper smelting, refining and rod fabrication.

2/ These figures are estimates made by the Arizona Department of Economic Security, in cooperation with the U.S. Bureau of Labor Statistics, and they include all full and part-time wage and salary workers who were employed in copper mining in any part of the pay periods which included the 12th of each month of the year.

3/ Estimates made by the U.S. Bureau of Labor Statistics, in cooperation with the 50 states, and based upon monthly samplings similar to those in 2/ above, adjusted periodically to census bench marks.

4/ Estimates of production (non-supervisory) workers based upon samplings as in 2/ above. Since 1975, figures have been calculated by the Arizona Department of Mines and Mineral Resources dividing the annual number of "All Employees - Arizona" by a factor of 1.26. This factor was derived by comparing the annual number of "All Employees - Arizona" with "Production Workers - Arizona" from 1970 to 1974.

5/ Earnings figures for a particular year is the product of "Average Hourly Earnings" and "Average Weekly Hours" for that year.

6/ Gross payroll aggregates, exclusive of irregular bonuses and other pay not earned in a sample pay period, are divided by gross man-hour aggregates of production and related workers for the period in order to determine average hourly earnings.

7/ "Average Weekly Earnings" times 52 weeks.

8/ Number of production workers times "Average Weekly Hours" times 52 weeks.

TABLE XX

REFINED COPPER INVENTORIES AT MONTH END
AMOUNTS IN THOUSANDS OF SHORT TONS

U. S. STOCKS

1982	Jan	351.9	Mar	387.3	May	422.5	Jul	463.7	Sep	436.2	Nov	470.8
	Feb	375.9	Apr	409.8	Jun	448.1	Aug	449.9	Oct	438.2	Dec	484.5
1983	Jan	489.6	Mar	508.9	May	519.4	Jul	509.0	Sep	509.1	Nov	505.2
	Feb	501.6	Apr	524.1	Jun	498.7	Aug	522.7	Oct	514.2	Dec	475.3
1984	Jan	497.8	Mar	483.3	May	463.4	Jul	493.4	Sep	467.1	Nov	457.3
	Feb	499.6	Apr	478.3	Jun	483.2	Aug	490.7	Oct	475.2	Dec	469.7

STOCKS OUTSIDE U. S.

1982	Jan	446.3	Mar	459.5	May	459.0	Jul	492.0	Sep	521.7	Nov	642.9
	Feb	448.4	Apr	452.2	Jun	479.3	Aug	504.4	Oct	592.3	Dec	699.9
1983	Jan	760.8	Mar	759.1	May	780.0	Jul	683.0	Sep	767.2	Nov	810.4
	Feb	766.4	Apr	795.5	Jun	722.2	Aug	757.4	Oct	765.2	Dec	832.5
1984	Jan	817.5	Mar	653.0	May	519.3	Jul	527.0	Sep	494.2	Nov	424.9
	Feb	730.0	Apr	618.5	Jun	551.9	Aug	511.0	Oct	480.0	Dec	N/A

WORLD STOCKS

1982	Jan	798.2	Mar	846.8	May	881.5	Jul	955.7	Sep	957.9	Nov	1,113.7
	Feb	824.3	Apr	862.0	Jun	927.4	Aug	954.3	Oct	1,030.5	Dec	1,184.4
1983	Jan	1,250.4	Mar	1,268.0	May	1,299.4	Jul	1,192.0	Sep	1,276.3	Nov	1,315.6
	Feb	1,268.0	Apr	1,319.6	Jun	1,220.8	Aug	1,280.1	Oct	1,279.4	Dec	1,307.8
1984	Jan	1,315.3	Mar	1,136.3	May	982.7	Jul	1,020.4	Sep	961.3	Nov	882.2
	Feb	1,229.6	Apr	1,096.8	Jun	1,035.1	Aug	1,001.7	Oct	955.2	Dec	N/A

Source: American Bureau of Labor Statistics.

Prepared by: State of Arizona Joint Legislative Budget Committee Staff.

Date: February 19, 1985

TABLE XXI

AVERAGE QUOTED PRICE OF 1/

ELECTROLYTIC COPPER WIREBAR

DOMESTIC, DELIVERED

U. S. ¢/lb.

	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
January	68.753	69.028	62.625	66.240	62.625	76.574	119.385	88.570	78.634	80.219	68.792
February	68.575	64.180	63.625	68.625	63.593	89.697	133.808	86.071	78.779	84.024	70.748
March	68.575	64.180	64.682	72.551	62.410	96.718	106.040	87.382	75.862	82.072	75.311
April	68.575	64.180	69.241	74.393	64.625	98.322	94.851	88.033	76.273	83.493	77.388
May	81.459	63.780	70.625	72.606	64.768	91.234	93.479	85.798	77.948	85.634	72.229
June	86.245	62.136	70.625	71.199	66.569	88.241	92.713	85.226	71.488	81.836	69.849
July	86.596	62.484	74.625	67.996	64.079	86.768	103.565	84.412	71.053	82.947	64.402
August	86.596	63.790	74.625	63.792	67.232	91.335	100.708	87.387	70.999	80.542	64.535
September	83.663	63.790	74.625	60.625	67.632	95.853	98.864	84.722	71.065	77.587	63.408
October	78.428	63.790	72.064	60.625	70.495	99.106	99.471	82.312	72.413	73.392	62.039
November	76.249	63.790	70.625	60.625	71.191	99.708	96.982	81.216	72.968	69.581	65.650
December	73.572	63.790	65.774	61.942	71.897	106.448	89.127	80.293	74.230	70.805	63.538

Source: Metals Week

1/ MW US Producer Delivered.

Prepared by: State of Arizona Joint Legislative Budget Committee Staff.

TABLE XXII

AVERAGE COPPER CASH PRODUCTION COSTS FOR THE UNITED STATES, 1981-84[1]

(Cents per pound of copper)

Product Costs	1981	1982	1983	1984	Long run[2]
Mine op. cost	32	26	22	20	26
Mill-Float op. cost	27	24	24	23	22
Mill-leach op. cost	8	9	7	7	5
Smelt/Refine/Transportation	28	28	26	24	24
Taxes[3]	3	3	3	2	3
Total Cost	98	90	82	76	80
Byproduct Credits	(19)	(13)	(13)	(11)	(11)
Cash Cost[4]	79	77	69	65	69
Production[5]-Thousand Short Tons of Copper	1,365	989	1,027	e1,105	1,504

e Estimated.

1 Includes 16 mines, most of which were producing from 1981 to 1984.

2 Long run costs include depreciation allowances to sustain production.

3 Property and severance taxes and royalties, if applicable.

4 Includes all cash cost of production and credit for byproducts but excludes depreciation and profit (except long run costs). Costs are in actual dollars for each year shown.

5 Based on the production of the 16 mines analyzed. Long run production is estimated full capacity level. Capacities are averaged over the life of the mine.

Source: U.S. Bureau of Mines Preprint from Bulletin 675 Chapter on Copper. Mineral Facts and Problems, 1985 Edition.

TABLE XXIII

COPPER RESERVES IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
ANAMAX MINING CO.	Helvetia	Sulfide	320	0.64	Pub. 1973; cutoff at 0.3% Cu.
	Helvetia	Oxide	20	0.55	Pub. 1973; acid soluble Cu; cutoff at 0.3% acid soluble Cu.
	Peach Elgin	Mixed	23	0.75	Pub. 1973; cutoff at 0.4% Cu.
	Twin Buttes & Palo Verde	Sulfide	106	0.69	Pub. in Amax Inc. 1984 Annual Report.
	Twin Buttes & Palo Verde	Oxide	16	0.82	Pub. in Amax Inc. 1984 Annual Report.
ANTIOCH RESOURCES	Zonia	Oxide	20.5	0.53	Pub. in 1980 E&MJ Int'l Directory.
ASARCO INC.	Mission	Sulfide	78.154	0.76	With 0.17 Ag oz/ton. Pub. ASARCO 1984 Annual Report.
	Poston Butte	Mixed		0.47	32-42 million tons possible. Pub. 1984 E&MJ 1972.
	Sacaton East (UG)	Sulfide	15.960	1.20	Pub. in ASARCO Inc. 1983 Annual Report.
	San Xavier	Sulfide	157.030	0.51	With .08 oz/ton Ag. Pub. in 1984 Annual Report.
	Silver Bell	Sulfide	20.955	0.68	With .07 oz/ton Ag. Pub. in 1984 Annual Report.
	Silver Bell	Oxide			
BS & K MINING CO.	Atlas	Mixed			
CASA GRANDE COPPER CO.	Casa Grande	Mixed	352	1.00	Pub. in Getty Oil Co. 1980 Annual Report.

TABLE XXIII (continued)

COPPER RESERVES IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
CF & I STEEL CORP.	Dragoon	Oxide			
COCHISE DEV. GROUP	Bisbee-North	Mixed (?)	20	0.80	Unpublished estimate.
COCHISE MINING CORP.	San Juan	Oxide	20	0.50	Unpublished estimate.
CONOCO INC.	Poston Butte	Mixed	800	0.40	Pub. 1979 from Copper Studies Inc.
CYPRUS MINES CORP.	Bagdad	Sulfide	326	0.50	With 0.03% Mo.
	Bagdad	Oxide	38	0.33	Acid soluble Cu.
	Bruce	Sulfide	0.1276	3.73	Pub. 1976 in Form 10-K with 12.8% Zn.
	I-10	Mixed	100	0.52	Unpublished estimate; with 0.02% Mo.
	Johnson	Oxide	3.926	0.40	Acid soluble Cu. Pub. in 1984 E&MJ International Directory.
	Pima	Sulfide	120.767	0.482	Pub. 1983 E&MJ International Directory.
DORE MINING & MILLING	Four Metals	Sulfide	3	0.82	Reported 1965.
A. DURHAM ET. AL.	Strong & Harris	Mixed	60	0.60	Unpublished estimate with 0.70% Zn.
DUVAL CORPORATION	Esperanza	Sulfide	48.783	0.27	With .034% Mo.
	Mineral Park	Sulfide	35.577	0.17	With .054% Mo.
	Sierrita	Sulfide	299.574	0.30	With .035% Mo. Pub. in 1984 E&MJ International Directory.

TABLE XXIII (continued)

COPPER RESERVES IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
EISENHOWER MINING CO.	Palo Verde (Anamax)	Sulfide	91.073	0.62	With 0.11 oz/ton Ag calculated.
	Palo Verde (ASARCO)	Sulfide	21.450	0.88	With 0.25 oz/ton Ag. Pub. in ASARCO 1984 Annual Report.
HARPOON, INC.	Sanchez	Oxide	79.362	0.36	Pub. in Inspiration Resources 1983 Form 10-K.
HOPE MINING & MILLING CO.	Mame	Oxide	2	1.00	Unpublished estimate.
INSPIRATION CONSOLIDATED COPPER CO.	Bluebird (OP)	Oxide	65	0.53	Pub. in Ranchers Explor. & Devel. Co. 1981 Annual Report.
	Christmas (OP)	Sulfide	7.567	0.63	Pub. in Inspiration Resources 1983 Form 10-K, p. 8.
	Christmas (OP)	Oxide			
	Christmas (UG)	Sulfide	20.131	1.82	(Same as above)
	Inspiration Area Mines	Mixed	174.751	0.52	(Same as above) Tonnage calculated for 1984.
	Ox Hide	Oxide	28.573	0.30	(Same as above)
KENNECOTT	Chilito	Mixed			
	Lone Star	Mixed	2000	0.41	Reported at Ariz. Conference AIME 12/77.
	Lone Star Ext.	Mixed			
	Ray	Sulfide	550	0.70	Estimated.
	Ray	Silicate	200	0.68	Estimated.

TABLE XXIII (continued)

COPPER RESERVES IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
KERR McGEE CORP.	Red Mountain	Sulfide		0.71	Pub. 1970, 100 million tons possible.
KEYSTONE MINERALS INC.	Korn Kob	Oxide	8	0.50	Pub. in "Pay Dirt" July 1973.
MAGMA COPPER CO.	Copper Creek	Sulfide			
	Kalamazoo	Sulfide	354.912	0.715	Proven & probable; 1984 Newmont Annual Report; 0.029 oz Ag/ton.
	Kalamazoo	Sulfide shaft pillar	101.000		1984 Newmont Annual Report.
	San Manuel	Sulfide	312.616	0.694	Proven & probable; 1984 Newmont Annual Report; 0.029 oz Ag/ton.
		Sulfide shaft pillar	98.000		1984 Newmont Annual Report.
		Oxide	56.534	0.468	Proven & probable; 1984 Newmont Annual Report.
		Oxide (Subsidence Area)	230.000	0.37	1984 Newmont Annual Report.
	Superior	Sulfide	4.439	5.69	Proven & probable; 1984 Newmont Annual Report; 0.71 oz Ag/ton.
NAVAJO TRIBE (?)	White Mesa	Oxide	2	0.75	Pub. 1955
NORANDA MINES LTD.	Lakeshore	Sulfide (Porphyry)	41	0.65	Published in Noranda's 1984 Annual Report.
	Lakeshore	Sulfide (Tactite)	8.9	1.35	Published in Noranda's 1984 Annual Report.
	Lakeshore	Oxide	13.1	1.16	Published in Noranda's 1984 Annual Report.
	Ventura	Sulfide	6.3	0.26	Reported 1965; with 0.28% MoS_2

TABLE XXIII (continued)

COPPER RESERVES IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
ORACLE RIDGE MINING PARTNERS	Oracle Ridge	Mixed (?)	11	2.5	Reported 1977; with 0.64 oz Ag/ton. Published 1979.
S. B. OWENS	Carlota	Oxide	4	0.85	Reported 1979.
PAPAGO TRIBE	Vekol Hills	Sulfide	105	0.56	Pub. 1978, minable by open pit, with 0.014% Mo; 16 million tons oxide Cu.
PHELPS DODGE CORP.	Copper Basin	Sulfide	175	0.55	Pub. 1974; minable by open pit with 0.02% Mo.
	Copper Queen	Mixed			
	Lavender	Sulfide			
	Morenci/Metcalf	Sulfide	831.600	0.76	1984 Annual Report.
	New Cornelia	Sulfide	209.200	0.50	" " "
	Safford	Mixed	262.400	0.88	" " "
	United Verde	Sulfide			
	United Verde	Oxide			
	Western Copper	Sulfide	184.000	0.64	" " "
PINTO VALLEY COPPER CORP.	Cactus	Oxide			
	Copper Cities	Oxide			
	Miami	Oxide			
	Miami East	Mixed (?)	5.976	3.14	Pub. in Newmont Mining 1984 Annual Report.
	Old Dominion	Sulfide			
	Pinto Valley	Sulfide	373.363	0.403	Pub. in Newmont Mining 1984 Annual Report.

TABLE XXIII (continued)

COPPER RESERVES IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE
V. A. SMITH ESTATE	Dynamite	Sulfide			
SQUAW PEAK COPPER	Squaw Peak	Sulfide	30	0.35	Unpublished estimate.
STANDARD METALS CORP.	Antler	Sulfide	5.1	1.95	With 4.13% Zn, 0.94% Pb, and 1.05 oz Ag/ton. Pub. in 1978 Annual Report & Form 10-K.
STEWART TITLE AND TRUST & TSC ENTERPRISES	Emerald Isle	Oxide	1.5	0.40	3 million tons at 0.1% Cu. USBM RI 8236, Pub. 1977.
UNDETERMINED	Mineral Hill	Mixed			
UNDETERMINED	Pine Flats	Sulfide	12	0.50	Unpublished estimate.
UNDETERMINED	Turquoise	Oxide	10	0.50	Published in 1975.
UNITED STATES GOVERNMENT	Park Hill	Mixed (?)	30	0.45	Unpublished estimate.
UNITED STATES GOVERNMENT & U.S. METALS CORP.	Apex	Mixed (?)			
VAN DYKE COPPER CO. & SHO-ME COPPER CO.	Van Dyke	Oxide	100	0.50	Published 1977.

TABLE XXIII (continued)

COPPER RESERVES IN ARIZONA 1/

COMPANY	DEPOSIT	MAJOR MINERAL TYPE	MILLIONS OF TONS	AVERAGE Cu CONTENT	REMARKS/SOURCE

1/ Reserves are given with a grade of average total copper content as of December 31, 1984, unless stated otherwise under "Remarks". As used in this table, reserves generally mean those estimated quantities of ore which, under present and reasonably forseen technical and economic conditions may be profitably mined and sold or processed for the extraction of their constituent values.